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THE

GEOLOGICAL RECORD

FOR

1874.

AN ACCOUNT OF WORKS

ON

GEOLOGY, MINERALOGY, AND PALÆONTOLOGY

PUBLISHED DURING THE YEAR.

EDITED BY

WILLIAM WHITAKER, B.A., F.G.S.,

OF THE GEOLOGICAL SURVEY OF ENGLAND.

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ALERE FLAMMAM.

PREFACE.

THE first work that should be recorded in this the first volume of the Geological Record is that of its Sub-Editors and Contributors, who have done their self-imposed task so zealously as to greatly lighten my own editorial duties, although at the same time increasing the size of the book to about a third more than the original estimate.

A word of thanks is also due to those gentlemen who came forward as Guarantors, in order to insure the expense of the work. It is most satisfactory, however, that their office proves to be purely honorary, the number of Subscribers being large enough to cover the cost of publication.

The British Association having now voted a grant towards the expenses of the Geological Record, we shall be relieved from financial anxiety in future.

It was, of course, impossible to compile such a book without some sort of classification; and the plan adopted is as simple as could be devised. Under each heading works are arranged alphabetically after the authors' names, except Maps, which are in the alphabetical order of places. There are altogether more than 2000 entries.

Some difficulty was felt in many cases in deciding whether a paper or journal was published in 1874 or earlier. When this occurred it was thought better to give the authors the benefit of the doubt; and therefore a few papers of 1873 may have been included, as well perhaps as some of 1875.

In some cases we have given the title only of a memoir, either from not being able to see the original, or from its having come to hand too late for further notice, even in the lengthy "Addenda." It is hoped that in future, when the 'Geological Record' is better known, it may have more aid from Scientific Societies sending their publications.

The delay in publication has been owing to various causes, but chiefly to the great extension of the book. However, as Subscribers get over 100 pages more than was promised, and at no additional cost, they can hardly complain.

In conclusion, I would thank the printers for the way in which they have done their work. *Sit perpetuum.*

WILLIAM WHITAKER.

London, December 1875.

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Abh. k.-k. geol. Reichs.—Abhandlungen der k.-k. geologischen Reichsanstalt. 4to. Vienna.

Abh. schweiz. Palæont. Gesell.—Abhandlungen der schweiz. Palæont. Gesellschaft. 4to. Basel.

Amer. Journ.—American Journal of Science and Arts. Newhaven.

Amer. Nat.—American Naturalist. Salem, Mass.

Ann. Chim. Phys.—Annales de Chimie et de Physique. Paris.

Ann. des Mines.—Annales des Mines. Paris.

Ann. Nat. Hist.—Annals and Magazine of Natural History. London.

Ann. Rep. Brighton Nat. Hist. Soc.—Annual Report of the Brighton and Sussex Natural-History Society.

Ann. Rep. Roy. Cornwall Polytech. Soc.—Annual Report of the Royal Cornwall Polytechnic Society. Falmouth.

Ann. Rep. S. C. N. York.—Annual Report on the State Cabinet of New York.

Ann. Rep. Smithson. Inst.—Annual Report of the Board of Regents of the Smithsonian Institution. Washington.

Ann. Rep. Warwick. Nat. Hist. and Archæol. Soc.—Annual Report of the Warwickshire Natural-History and Archæological Society. Warwick.

Ann. Sci. Géol.—Annales des Sciences Géologiques. Paris.

Ann. Sci. Nat.—Annales des Sciences Naturelles. Paris.

Ann. Soc. Géol. Belg.—Annales de la Société Géologique de Belgique, comprising *Mémoires* and *Bulletin*. Liège.

Ann. Soc. Géol. Nord.—Annales de la Société Géologique du Nord. Lille.

Ann. Soc. Mal. Belg.—Annales de la Société Malacologique de Belgique. comprising *Mémoires* and *Bulletin*. Brussels.

An. Soc. Españ. Hist. Nat.—Anales de la Sociedad Española de Historia Natural.

Arb. geol. Landesdurch. Böhm.—Arbeiten der geologischen Landesdurchforschung von Böhmen.

Arch. Mus. Teyler.—Archives du Musée Teyler. Haarlem.

Arch. nat. Land. Böhm.—Archiv für die naturwissenschaftliche Landesdurchforschung von Böhmen. Prague.

Arch. Naturk. Liv-, Esth- Kurlands; Dorpat. Naturf. Gesell.—Archiv für die Naturkunde Liv-, Esth- und Kurlands. Herausgegeben von der Dorpater Naturforscher-Gesellschaft. Dorpat.
Arch. Sci. Phys. et Nat.—Bibliothèque Universelle et Revue Súisse, Archives des Sciences Physiques et Naturelles. Geneva.
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Canad. Nat.—Canadian Naturalist and Quarterly Journal of Science, with the Proceedings of the Natural-History Society of Montreal. Montreal.
Chem. Centr.—Chemisches Centralblatt. Leipzig.
Chem. News.—Chemical News and Journal of Physical Science. 4to. London.
Cincin. Quart. Journ. Sci.—Cincinnati Quarterly Journal of Science.
Coll. Guard.—Colliery Guardian. Fol. London.
Compt. Rend.—Comptes Rendus hebdomadaires des Séances de l'Académie des Sciences. 4to. Paris.
Compt. Rend. 2 sess. Assoc. Franç.—Association Française pour l'avancement des Sciences. Comptes-Rendus de la 2ième Session. Paris.

Denkschr. k. Ak. W.—Denkschriften der kaiserlichen Akademie der Wissenschaften. 4to. Vienna.

Forhand. Vid.-Selsk.—Forhandlinger i Videnskabs-Selskabet i Christiania.

Geogr. Mag.—Geographical Magazine. London.
Geol. fören. Stockholm Förhandl.—Geologiska föreningens i Stockholm Förhandlingar.
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Journ. Zool.—Journal de Zoologie. Paris.

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Papers Eastbourne Nat. Hist. Soc.—Papers of the Eastbourne Natural-History Society (reprinted from a local newspaper). 4to.
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Rec. Geol. Surv. Ind.—Records of the Geological Survey of India. Calcutta.
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Rev. Mar. et Col.—Revue Maritime et Coloniale. Paris.
Rev. Sci.—Revue Scientifique de la France et de l'Étranger. 4to. Paris.
Rev. Univ. des Mines.—Revue Universelle des Mines, de la Métallurgie des Travaux Publics, des Sciences et des Arts appliqués à l'Industrie. Paris.

Sitzungsb. Gesell. Beförd. ges. Naturwis. Marburg.—Sitzungsberichte der Gesellschaft zur Beförderung der gesammten Naturwissenschaften zu Marburg.
Sitzungsb. Isis Dresden.—Sitzungsberichte der naturwissenschaftlichen Gesellschaft Isis in Dresden.
Sitzungsb. k. Ak. Wiss. math.-nat. Cl.—Sitzungsberichte der kaiserlichen Akademie der Wissenschaften, mathematisch-naturwissenschaftliche Classe. Vienna.
Sitzungsb. math.-phys. Classe k.-b. Ak. Wiss.—Sitzungsberichte der mathematisch-physikalischen Classe der königlich-bayerischen Akademie der Wissenschaften zu München. Munich.
Sitzungsb. naturf. Gesell. Leipzig.—Situngsberichte der naturforschenden Gesellschaft zu Leipzig.
Sitzungsb. phys.-med. Soc. Erlangen.—Sitzungsberichte der physikalisch-medicinischen Societät zu Erlangen.
Skand. Natur. Forhandl.—Skand. Naturforskermödet Forhandlingar. Copenhagen.

Sveriges Geol. undersök.—Sveriges Geologiska Undersökning. [Swedish Geological Survey.] Stockholm.

Trans. Amer. Inst. Min. Eng.—Transactions of the American Institute of Mining Engineers.
Trans. Bot. Soc. Edin.—Transactions of the Botanical Society of Edinburgh.
Trans. Connecticut Ac. Sci.—Transactions of the Connecticut Academy of Sciences.
Trans. Devon. Assoc.—Transactions of the Devonshire Association for the Advancement of Science, Literature, and Art. Plymouth.
Trans. Edin. Geol. Soc.—Transactions of the Edinburgh Geological Society.
Trans. Geol. Soc. Glasgow.—Transactions of the Geological Society of Glasgow.
Trans. Inst. Surveyors.—Transactions of the Institution of Surveyors. London..
Trans. Manchester Geol. Soc.—Transactions of the Manchester Geological Society.
Trans. N. Engl. Inst. Eng.—North-of-England Institute of Mining and Mechanical Engineers. Transactions. Newcastle-on-Tyne.
Trans. Nov. Scot. Inst.—Transactions of the Nova-Scotian Institute of Natural Science. Halifax, N. S.
Trans. N. Zealand Inst.—Transactions and Proceedings of the New-Zealand Institute. Wellington.
Trans. Plymouth Inst.—Annual Report and Transactions of the Plymouth Institution.
Trans. Roy. Soc. Edin.—Transactions of the Royal Society of Edinburgh. 4to.
Trans. Roy. Soc. Victoria.—Transactions of the Royal Society of Victoria. Melbourne.
Trans. Zool. Soc.—Transactions of the Zoological Society of London. 4to.

Verh. k.-k. geol. Reichs.—Verhandlungen der kaiserlich-königlichen geologischen Reichsanstalt. Vienna.
Verh. naturf. Gesell. Basel.—Verhandlungen der naturforschenden Gesellschaft in Basel.
Verh. nat. Ver. Carlsruhe.—Verhandlungen des naturwissenschaftlichen Vereins in Carlsruhe.
Verh. schweiz. naturfor. Gesell.—Verhandlungen der schweizerischen naturforschenden Gesellschaft. Schaffhausen.
Verh. Würzburg phys.-med. Ges.—Verhandlungen der Würzburg physikalisch-medicinischen Gesellschaft in Würzburg.
Ver. Med. Kon. Ak. Wet.—Verslagen en Mededeelingen der Koninklijke Akademie van Wetenschappen. Amsterdam.

Zeit. deutsch. geol. Gesell.—Zeitschrift der deutschen geologischen Gesellschaft. Berlin.
Zeit. gesam. Nat.—Zeitschrift für die gesammten Naturwissenschaften. Berlin.

ERRATA.

P. 5, line 27, *for* BROWN, W. J. *read* BROWN, D. J.

P. 14, line 16 from foot, *for* Gedsgrave *read* Gedgrave.

„ HABETS, A. The two notices under this name should not have been inserted, the original papers being noticed.

P. 17, line 21, *for* Detitral *read* Detrital.

P. 22, line 9 from foot, *for* extension *read* extrusion.

Pp. 31, 32. PRESTWICH should have come before PRICE.

P. 35, line 16, *for* Luddenham *read* Luddenden.

P. 45, line 3, *for* and *read* or.

P. 53, line 26, *for* criticsied *read* criticised.

P. 56, line 7 from foot, for *Pleurodyctium* read *Pleurodictyum*.

P. 74, Under JERVIS, line 2, *for* de *read* di. This paper is noticed in "Addenda," p. 372.

„ line 9 from foot, *for* Hævningsfænomenerne *read* Hœvningsfœnomenerne.

P. 79, line 5 from foot, *for* Wengen *read* Werfen.

P. 86, top, NEUMAYR should have come in p. 85.

P. 134, line 3, *for* FRAS *read* FRAAS.

P. 158, line 3, *after* R. *insert* E.

P. 178, *for* PATTERSEN *read* PETTERSEN.

P. 180, line 17 from foot, *for* amnörkningar *read* anmärkningar; and *for* antedning *read* anledning.

P. 216, line 4 from foot, *for* Sucé *read* Luce.

P. 217, line 10, *for* Allesburg *read* Altenburg.
„ „ 17, „ Angora „ Angarà.
„ „ 21, „ Angorà „ Angarà.

P. 218, line 20, *for* 17·45 *read* 14·75.
„ „ 25, „ Burkart „ Borkub.
„ „ 33, „ Ledran „ Lodran.
„ „ 1 from foot, and 2nd line of p. 219, *for* under *read* during.

P. 219, line 11, *for* Jousac *read* Jonsac, and *for* Jurinas *read* Juvinas.

P. 220, lines 1, 11, 28, and 3 and 7 from foot, *for* Orivinio *read* Orvinio.
„ „ 2, *add* p. 459.
„ „ 25, „ lxx. p. 459.

P. 223, line 14 from foot, *after* woodcuts *insert* See also pp. 48-53.

P. 243, *for* NEWBERRY *read* NEWBERY.

P. 252, line 21 from foot, *for* Helleflinta *read* Hälleflinta.

P. 253, line 8 from foot, *for* fån *read* från.
„ „ 3 „ the formula should be
$4\,Ca(FCl) + 5\,[3\,CaO\,(PO_5 . As\,O_5)]$.
„ under STRÜVER *insert* Atti R. Ac. Sci. *before*, *and* vol. ix. p. 763 *after* Turin.

P. 256, line 19 from foot, *for* species *read* specimens.

P. 257, line 2 from foot, *for* chalcedomy *read* chalcedony.

P. 282, last line, *for* ABTH *read* ALTH.

P. 295, line 8 from foot, *after* Rhône *insert* $4^{\text{ième}}$ Partie. Lias supérieur.
„ „ 7 „ „ iv. „ Pp. 335, 62 plates.

P. 329, line 7, *for* JOKN *read* JOHN.

P. 334, line 22, *for Noeggarathia read Noeggerathia.*

P. 335, „ 7 from foot, *after* Geol. *insert* Mag.

P. 337, line 3, *add* In part also (under the title "New Vegetable Fossils of Victoria") in Appendix, Reports of the Mining Surveyors and Registrars, No. 84, pp. 41–42, plates ix., x.

P. 351, line 9 from foot, *for* Nagnès *read* Noguès.

P. 352, line 22, *for* incised *read* worked.

THE

GEOLOGICAL RECORD

FOR 1874.

STRATIGRAPHICAL AND DESCRIPTIVE GEOLOGY.

I. *BRITISH ISLES.*

Aitkin, J. On the occurrence of High level Drift in the neighbourhood of Bacup. Trans. Geol. Soc. Manchester, vol. xiii. part v. p. 133.

Describes the occurrence of pebbles and other drift on Holcombe Hill, at Horncliffe and Brandwood Moors, at Bull Hill, at the summit of Cribden (overlooking Rawtenstall), and at Dirpley Hill (1060 to 1370 feet). Two flints were found which had been chipped by man. At Bull Hill Mr. Aitkin has since found flint-flakes (arrow-heads) at the bottom of the peat. C. E. De R.

——. Remarks on the Bone Cave of Windy Knoll, near Castleton, recently described by Mr. Plant. Trans. Geol. Soc. Manchester, vol. xiii. part v. p. 151.

States that the ossiferous fissure described was the same as that from which he saw a large number of bones thrown out five or six years ago. C. E. De R.

Anon. Note of Meeting at Burton Dasset and Kineton. Proc. Warwickshire Nat. and Archæol. Field Club for 1873, p. 17.

——. Note of Excursion to Northampton. Ibid. pp. 18–20.

——. Note of Meeting at Eatington. Ibid. pp. 21, 22.

——. [William Gray.] The Geology in the 'Guide to Belfast and the Adjacent Counties,' by the Belfast Naturalists' Field Club. Pp. 20–77, plates 1–8, 36 (Sections, Fossils, &c.). 8vo. Belfast.

Gives a description of all the rocks of the counties of Antrim and Down, from granite to peat, noting the chief sections and mineral products, with analyses of Magnesian Limestone, Lias, and Chalk. W. W.

——. "Physical Features" and "Geology" in Murray's 'Handbook for Travellers' in North Wales. Ed. 4, pp. v–xvi. 8vo. Lond.

ANON. [Rev. H. H. WINWOOD.] Summary of Proceedings for the year 1873-4. Proc. Bath Nat. Hist. and Antiq. Field Club, vol. iii. no. 1.

Notices of Excursions:—to Broadfield Down, with geological notes, pp. 90, 91; to Old Down and Radstock, pp. 101, 102. H. B. W.

——. Discovery of a Coal Seam at Sandwell Park. Geol. Mag. dec. 2, vol. i. p. 240.

Mentions the discovery of the "brooch-coal" at a depth of 380 yards, and of the "herring-coal" below it.

——. The Sandwell Park Trial Sinking. Geol. Mag. dec. 2, vol. i. p. 336.

The "thick coal," 20½ feet thick, was found at 418 yards.

——. Excursion to Charlton. Proc. Geol. Assoc. vol. iii. no. 5, pp. 205, 206.

Prof. Morris remarked that though we have here the Thanet Sands lying conformably on the Chalk, it is probable that we have lost some hundreds of feet of chalk, either by denudation or by decomposition after the deposit of the sands, and that the bed of green-coated flints on the Chalk must have been formed by the quiet and slow removal of part of the latter. W. W.

——. Excursion to Aylesbury. Ibid. pp. 210, 211.

Notices various sections.

——. Excursion to Brighton. Ibid. no. 6, pp. 239, 240.

Prof. T. R. Jones referred the formation of the "Elephant Bed" (chalk débris) to a banking-up, from the "reflex action of the tides consequent on the obstruction of the isthmus which existed where are now the Straits of Dover." W. W.

——. Excursion to Hatfield. Ibid. no. 6, pp. 240-242.

—— [K. L. G.]. Geology of Clevedon. Science Gossip, no. 113, p. 117.

Chiefly questions.

ARGALL, W. The Ironstone Works at Easton Neston, Northamptonshire. Rep. Miners' Assoc. Cornwall and Devon for 1873, pp. 27, 28.

There are two beds of ironstone, containing about 40 per cent. of metal. The upper, 12 feet thick, is separated by 10 or 15 feet of an ochreous substance from the lower, which is 20 feet thick. C. L. N. F.

BAILY, W. H. Sketch of the Geology of Belfast and the Neighbourhood. Science Gossip, no. 116, pp. 169, 170.

Notices the chief places of geological interest.

BARNETT, A. K. Observations on the Elvan Courses, Greenstones, and Sandstones of Cornwall, with Remarks on their associated Minerals. 41st Ann. Rep. Roy. Cornwall Polytech. Soc. pp. 142-181; and Rep. Miners' Assoc. Devon and Cornwall for 1873, pp. 69-94, with a map.

Mr. Barnett gives the following definition of elvans:—"The Cornish Elvans are rocks occurring in veins or dykes composed of two or more of the following minerals in variable proportions—quartz, felspar, mica, schorl, and chlorite—the base being granular or compact, and generally containing imbedded crystals of its components, which render it porphyritic." After separating them into six different groups, he gives a description of sixty-two elvan-courses, mentioning the principal quarries or mines where sections may be seen. Very little is said about the greenstones and sandstones. C. L. N. F.

Barr, Thomas M. On the Geology of the North-Eastern District of Yorkshire. Trans. Geol. Soc. Glasgow, vol. iv. part 3, pp. 291–300, plate (map).

A general account of the geological features of the country between the Tees and Eskdale. The map, on the scale of six miles to an inch, shows roughly the boundaries of the Upper Oolite, Oolite, Lias, Trias, and Permian. A short analysis of statistics as to the produce &c. of the Cleveland iron-ore is given. G. A. L.

Barrow, J. The Llynfi Mineral District. Plates 22–29 (map and sections) issued with Proc. S. Wales Inst. of Eng. vol. viii. no. 5. Discussion, ibid. vol. ix. no. 1, pp. 12–17.

Bassett, A. The Diamond Drill. Trans. N. Engl. Inst. Eng. vol. xxiii. plates xxxvi.–xl.

Gives sections of Coal Measures passed through in borings at Risca [? and elsewhere].

Beddoe, Dr. J. Address to the Department of Anthropology. Rep. Brit. Assoc. for 1873, Sections, pp. 134–140.

The author points out the threefold division of Yorkshire—not that into ridings, but that marked out by nature. (1) The western moorlands—the region of Carboniferous Limestone and Millstone Grit, of narrow valleys, and cold rainy moorlands. (2) The Plain of York—the region of the Trias, monotonously fertile; to this the plain of Holderness and the vale of Pickering may be regarded as eastern adjuncts. (3) The eastern moorlands and wolds; these are the most important parts of Yorkshire to the prehistoric archæologist. Large as the county is, and sharply marked off into districts by striking diversities of geological structure, climate, and surface, there is an approach to unity in its political and ethnological history which could scarcely have been looked for. W. T.

Bedwell, F. A. The Isle of Thanet. The Ammonite Zone, the Depth of the Chalk in Section, and the Continuity of its Flint Floorings. Geol. Mag. dec. 2, vol. i. pp. 16–22, 94 (map and sections).

The total thickness of Chalk in the cliffs of the Isle of Thanet is 180 feet. The highest bed is seen at Foreness, the lowest near Pegwell. The author has marked the positions of 89 large Ammonites (which average 3 feet in diameter), taking as a datum the double line of nodular flints which is exhibited nearly continuously from Birchington to Kingsgate. The Ammonites occur from 4½ to 60 feet below this line; 32 specimens were found at an average of 12 feet, and 25 specimens at an average of 20 feet. 35 specimens were identified as *A. leptophyllus*, 4 as *A. Lewesiensis*, and 1 as *A. peramplus*; but the author suggests that these three forms may be identical. The Ammonite zone, covering a depth of between 55 and 56 feet, contains no layers of flints; but there are flints occasionally scattered through it.

Two bands of flint are particularly mentioned. The upper forms a solid floor of flint, 3 to 4 inches thick, and is known by well-diggers all over the island. The lower lies 31 feet below this; it is a foot or more thick, and resembles a large mass of irregular honeycomb. At irregular intervals there are vertical columns of flint uniting this band with the one above. At Pegwell Bay 51 feet of chalk, which is to be seen on the Margate cliffs, is said to be wanting. W. T.

Bedwell, F. A. On Ammonite zones in the Isle of Thanet. Proc. Geol. Assoc. vol. iii. no. 5, pp. 217–238. Map and sections as in Geol. Mag.

This is a shorter notice of the facts stated in the foregoing paper.

Beesley [T.]. Excursion to Banbury. Proc. Geol. Assoc. vol. iii. no. 5. pp. 197–204.

Notices sections of Middle Lias near Banbury, of the Ironstone-quarries at King's Sutton and Adderbury, and of the Great Oolite near Broughton and Tadmarton Heath. W. W.

Bennett, Captain S. Remarks on Metalliferous Veins. Rep. Miners' Assoc. Cornwall and Devon for 1873, pp. 1–8.

The principal object is to show that nearly all good lodes in Cornwall and Devon dip towards granite or an elvan dyke. C. L. N. F.

Blake, Rev. J. F. Note on the Red Chalk in Yorkshire. Geol. Mag. dec. 2, vol. i. pp. 362–364 (woodcut).

The author describes a section near Givendale church [wrongly described beneath the woodcut as near Ripon, W. R. of Yorkshire], in which is Red Chalk containing *Ammonites Deshayesi*; it rests on conglomerate, and this on sandstone the age of which is doubtful, but which is unlike any Oolitic sandstone of the district. In other places in the neighbourhood conglomeratic beds and sandstones underlie the Red Chalk. It is suggested that these may be littoral deposits formed in hollows. Subsequent depression enabled the Red Chalk to spread over a wide area, but not without interruptions; for there are gaps and varieties of level in the Red Chalk that may be better accounted for by an irregular surface than by faults.

Red Chalk is found in the White Chalk at Warter; this is simply ordinary chalk coloured red; but the true Red Chalk, or Hunstanton Rock, generally has much sandy matter and small round grains of the same dark rock which furnished the older conglomerate. Near Londesborough the White Chalk contains some layers of brown carbonaceous clay. W. T.

Brodie, Rev. P. B. Notes on a Railway-section of the Lower Lias and Rhætics between Stratford-on-Avon and Fenny Compton, on the occurrence of the Rhætics near Kineton, and the Insect-beds near Knowle in Warwickshire, and on the Recent Discovery of the Rhætics near Leicester. Quart. Journ. Geol. Soc. vol. xxx. pp. 746–749.

The first-named sections are the best in Warwickshire; it is probable that the Rhætic beds underlie the Lias throughout the county. As a general rule, in Warwickshire, when the White Lias is absent its place is occupied by the "firestones" and "guinea-bed," and *vice versâ*. At Spinney Hills, near Leicester, Rhætic beds have been found. They contain the ordinary fossils, with the addition of *Ophiura*. The paper concludes with a note on the range of the Rhætics in England. W. T.

Brogden, A. On the Rampside Boring, near Barrow. Journ. Iron and Steel Inst. no. 2, 1874, pp. 300–319.

Brothers, A. [Note on a Well at Southend.] Proc. Lit. Phil. Soc. Manchester, vol. xiii. no. 9, p. 91.

[Section described, in 1872, in Geol. Survey Mem. vol. iv.]

Brown, T. F. The South-Wales Coal-field. Trans. N. Engl. Inst. Eng. vol. xxiii. pp. 197–256 (plates xlii.–xlvi., sections and plans).

Enters into details concerning the history, yield, method of working, &c. of the coal-field. The Coal-measures, of a total thickness of more than 7000 feet, are divided into three series:—(1) Upper Pennant, varying from 400 to 3000 feet in thickness; (2) Lower Pennant, from 1100 to 3000 feet; (3) White Ash series, from 500 to 1000 feet. Analyses of ironstones are given. W. T.

Brown, W. J. On the Silurian Rocks of the South of Scotland.—Part II. Llandovery Rocks. Trans. Edin. Geol. Soc. vol. ii. part iii. pp. 316–321.

Discusses the position of the Moffat Shales in the Lower Silurian series of the South of Scotland, and treats of the Llandovery Rocks of Ayrshire and their supposed relations to the beds on which they rest. H. A. N.

——. On the Silurian Rocks of the South of Scotland.—Part III. Wenlock and Ludlow Rocks. Trans. Edin. Geol. Soc. vol. ii. part iii. pp. 377–383.

Notices the Upper Silurian rocks of Kirkcudbright, the Pentland Hills, and Lesmahagow. Gives the conclusions to which he had been led by his study of the Silurian rocks of the South of Scotland, and concludes with a table embodying what he believes to be their true arrangement. H. A. N.

Callaway, C. On the Occurrence of a Tremadoc Area near the Wrekin, in South Staffordshire, with Description of a New Fauna. Quart. Journ. Geol. Soc. vol. xxx. p. 196.

Notes a section of light-green micaceous shales, at Shineton, near Cressage. The author believes the beds to be of Tremadoc age, and describes, as new therein, 9 fossils from the locality. W. T.

Champernowne, A. On the Discovery of a species of Starfish in the Devonian Beds of South Devon. Geol. Mag. dec. 2, vol. i. p. 5.

The specimens were found at Inglebourne House (about three miles S.S.W. of Totnes), in coarse slates, with one or two thin gritty layers. The author believes the beds to belong to the Upper South Devon Series. W. T.

——. On a Contortion of the Limestone at Torquay, and the presence of *Calceola sandalina* at its base. Trans. Devon. Assoc. vol. vi. part 2, pp. 548-551, 1 plate.

Referring to the distorted, faulted, and contorted peninsula on which Torquay stands, Mr. Champernowne proceeds to cite various instances to show that in its structure it is a great anticlinal. He directs attention to a remarkable, but less apparent, contortion of the limestone at the west end of Meadsfoot beach, and brings forward evidence, mainly on palæontological grounds, to prove that the isolated limestone knoll near Hesketh Crescent is in reality a repetition of the main body of the same rock which forms Daddy-Hole plain. This latter has *Calceola sandalina* at its base, and is separated from the "knoll" by a mass of grey or olive-coloured shales (or slates). T. M. H.

Close, Rev. Maxwell. The Elevated Shell-bearing Gravels near Dublin. Journ. Roy. Geol. Soc. Ireland, ser. 2, vol. iv. pt. 1, pp. 36-40. (Also in Geol. Mag. dec. 2, vol. i. pp. 193-197.)

The author had already mentioned having found marine shells in the elevated Pleistocene gravels near Dublin, at heights of 1000 and 1200 feet above the present sea-level. The shells are in a fragmentary condition, and are scarce. They occur in the "limestone-gravels" which rest on the sides of the Three-Rock Mountain, near Ballyedmonduff, also near the ruins of Caldbeck Castle; between Kilmashogue and Tibradden hill-spurs; near Ballybrack road and the military road; and near the summit of Montpelier Hill (850 to 1200 feet). The shells obtained are all of living species, but as a group they present a more boreal *facies* than those of the present coasts and of the low-level gravels. The pebbles of the gravels are subangular and scratched; and the nearest limestone ground whence they could have come is from 2¾ to 4½ miles distant, and from 800 to 900 feet lower down. Hence the author infers that the gravels could not have been brought to their present situation by water alone, but were, together with the associated shell-fragments, transported from a north-westerly direction, and that the animals to which the shells belonged lived and died somewhere else, towards the north-west, before the time when the sea was deep enough to deposit the elevated gravels. E. T. H.

Collins, J. H. On the Great Perran Iron Lode. Rep. Miners' Assoc. Cornwall and Devon, for 1873, pp. 55-69, with a map.

The great Perran lode bears about 35° N. of W., averages perhaps thirty feet in width for a course of several miles, underlies from 3 to 4 feet in a fathom, and contains large quantities of spathose iron. The upper part of the lode consists chiefly of brown hæmatite, due to the decomposition of the spathose ore which is met with, before the sea-level is reached. The great bunches of ore in the Perran lode appear to occur where it is crossed by the north and south lead-lodes of the district. No less than eighteen different minerals occur in connexion with the lode. Analyses of the ore are given, and also an analysis of the garnets that are sometimes found near it. C. L. N. F.

Crosskey, Rev. H. W. Report of the Committee appointed for the purpose of ascertaining the existence in different parts of the United Kingdom of any Erratic Blocks or Boulders. Rep. Brit. Assoc. for 1873, pp. 188–194.

The report notes the occurrence of striated Charnwood-Forest boulders at Hugglescote railway-cutting, near Bardon Hill. Similar boulders are described from Ketley gravel-pit, 50 miles distant from Charnwood Forest, where they are associated with travelled boulders of granite, probably from Cumberland or Scotland, and with blocks of local origin. The boulders occur in sand, with molluscous shells, chiefly in fragments; thirteen species have been identified, of which only one (*Astarte borealis*) is extinct in British waters. The report gives details of the method employed in mapping the boulders of the Midland districts; some information regarding the boulders of this area is given; and the report concludes with a description, by Mr. Pengelly, of a granite boulder on the shore of Barnstaple Bay. W. T.

Dakyns, J. R. On the Geology of part of Craven. Rep. Brit. Assoc. for 1873, Sections, pp. 78, 79.

This paper gives a great amount of detail; it describes the divisions of the Millstone Grit, comparing them with those in other districts. The whole series is divided into two by a conspicuous grit, continuous with the third grit of Lancashire, and here named the middle grit. The general run of the rocks in the basin of the Aire is described: the general strike is N.E. and S.W.; but about the latitude of Skipton it changes to E. and W. The Yoredale rocks are described. W. T.

Darbishire, R. D. Note on a Deposit of Middle Pleistocene Gravel in the Worden-Hall Pits, near Leyland, Lancashire; and on a Collection of Shells and Fragments of Shells found there by Miss M. H. Ffarington. Quart. Journ. Geol. Soc. vol. xxx. pp. 38–40 (see also Proc. Lit. and Phil. Soc. Manchester, vol. xiii. p. 72).

The pit is from 40 to 50 feet deep; the top part is in a yellow brick-clay, the bottom part in a fine sea-sand (of unknown depth); between these lies the gravel, 30 to 40 feet thick. The pebbles are of many kinds; there are often fragments of Mountain Limestone, flints rarely occur; some of the larger stones are striated. Fragments of marine shells occur throughout the gravel, but the larger number at its base, just above the sand; here the shells are often unbroken. The shell-bearing band is 240–250 feet above the sea.

The shells resemble those found in the Wexford gravels; they also represent the present fauna of the western shore of Britain, except that an arctic shell (*Fusus craticulatus*, Fabr.) also occurs. W. T.

Davey, E. C. The "Sponge-Gravel" Beds at Coxwell, near Faringdon; with an Appendix on Cole's Pits. Paper contributed to the Newbury Field Club. 8vo. pp. 14. 20 photographic illustrations (18 of fossils). Wantage.

The "Sponge-Gravel" crops out over a space of about a mile by a quarter of a mile, and is from 25 to 40 feet thick, forming a plateau based on Kimmeridge Clay, and capped in places by dark ironsand. The bed is a conglomerate of sand and fossils, mostly hardened by a ferruginous cement. There has been much dispute as to the age of this gravel, it having been referred to the Lower Greensand, Upper Greensand, and the highest (Maestricht) Chalk. Sharpe appears to have been led to take this last view from the abundance of Polyzoa; but the author finds that of about fifty species found at Coxwell not six occur at Maestricht; nor does he think that any species of sponge is common to the two deposits.

It is now allowed that these gravels belong to the Lower Greensand, on these grounds:—1. Similarity with Lower Greensand at Seend &c.; 2. Presence of Lower Greensand Brachiopoda and Echinodermata; 3. Infraposition to the Lower Greensand ironsand of Furze Hill; 4. Dissimilarity to Upper Greensand, which is fairly developed in the neighbourhood.

The fossils are of two sorts—those that lived on the spot, and those derived from Oolitic beds. The latter can be distinguished by colour and condition, and they are chiefly the remains of Vertebrates; the former are Sponges, Polyzoa, Echinoderms, and bivalve Mollusca, the absence of univalves being remarkable. The Sponges are most important, both as forming a large part of the gravel and from their good preservation. Sharpe names sixteen species, differing greatly in form and size. The author makes some additions to this list, and suggests the omission of other forms.

"Cole's Pits" are old excavations, extending over 14 acres. They have, by some, been regarded as the remains of early British habitations; and the largest has been assigned to no less a person than "King Cole." The author shows that this view is untenable, and that the pits are only the remains of old workings. W. W.

Dawkins, W. B. Report of the Committee appointed for the purpose of exploring the Settle Caves. Rep. Brit. Assoc. for 1873, pp. 250, 251.

The cave-earth, containing the remains of hyæna, bear, mammoth, &c., is overlain by laminated clay, and underlain by a confused bed of large limestone blocks imbedded in clay, partly amorphous, partly laminated, with sand in some places. These deposits are covered up at the mouth of the cave by a talus of angular fragments; excavations have shown that this talus graduates in its lower part into a clay containing scratched Silurian stones. Mr. Dawkins thinks that the laminated clay has been shown to lie at various levels; and he considers that it may be forming even now below the cave-earth, being washed there by rain. Whilst the author believes that the evidence of the relation of the older deposits to the glacial phenomena of the district is not very clear, he yet thinks that the fauna of the cave-earth was preglacial. The postglacial river-deposits of northern England have not yielded such remains, whilst they are abundant in districts south of a line drawn between Chester and York. W. T.

Dawkins, W. B. Cave Hunting. Researches on the Evidence of Caves respecting the Early Inhabitants of Europe. (Coloured plate and woodcuts.) Pp. xix, 455. 8vo. London.

Chap. i. The history of Cave-exploration is given; and ossiferous caves are divided into three groups—Historic, Prehistoric, and Pleistocene. Chap. ii. Caves are described as of various ages, formed generally by the agency of fresh water and the chemical action of carbonic acid, but occasionally by the sea and by volcanic action. Chap. iii. treats of the Historic Caves of Britain; Chap. iv. of the Caves of the Iron and Bronze age in Britain: those of Césanda in Portugal are described as having probably been inhabited by cannibals. Chap. v. treats of the Neolithic caves of North Wales with bones of platycnemic men, the tallest of whom was not more than 5½ feet high. Chap. vi. It is stated that skulls of dolichocephalic and brachycephalic types are found in British Neolithic caves; the former are cognate with the Basque people, who were invaded by the Celts, these by the Belgæ, and these again by the Germans: the first two had brachycephalic skulls, the long-headedness of the last being due to frontal development, instead of occipital as in the Basques. Chap. vii. Various caves of doubtful age are described. Chap. viii. An account is given of the Pleistocene caves of Germany and North Britain; and valleys are shown to have been excavated, and great physical changes to have taken place, since palæolithic man lived in these caves. Chap. ix. The same species of animals found associated with palæolithic man in caves are described as occurring with him in the old river-gravels; and it is thought that the same race of man occurs in both, a race closely allied to the modern Esquimaux. Chap. x. The caves of Southern Europe, the fossil Mammalia of Algeria, and the former continuity of Africa by way of the Iberian peninsula are described. Chap. xi. The Glacial period does not separate one life-era from another; two faunas are described—the one a northern group, the other a southern group. Chap. xii. The Pleistocene is divided into late, middle, and early by means of the Mammalia. C. E. De R.

De Rance, C. E. On the Physical Changes preceding the Deposition of the Cretaceous Strata in the South-west of England. Geol. Mag. dec. 2. vol. i. pp. 246–253.

The author first describes the Cretaceous beds of West Dorset and South Somerset. Beneath the Yellow Chalk there are the following zones (in descending order)—of *Scaphites æqualis*, of *Pecten asper*, of *Exogyra conica*, Fox mould, Cow-stones or zone of *Hoploparia longimana*, Gault. The fossils of the Dorsetshire Gault resemble those of the Lower Gault at Folkestone. Notes on the gravels and faults of the area are given. The author considers the conditions under which the Cretaceous beds were deposited, referring largely to published works. He regards the Phosphate-beds, which recur at intervals throughout the Cretaceous series, as evidence of a continuous coast-line throughout that period, from which it seems that shells were washed by currents at times when changes of sediment (and consequently of fauna) were taking place. W. T.

Dewick, Rev. E. S. The Geology of Eastbourne and its Vicinity. Chap. vi. of 'Handbook for Eastbourne,' by G. F. Chambers. 6th edit. 8vo. London & Eastbourne, pp. 143–150.

Contains a list of fossils from the Cretaceous rocks of Eastbourne.

Dickenson, J. On the Saliferous Strata. Trans. Geol. Soc. Manchester, vol. xiii. part ii. p. 23.

Gives the results of his Report to Parliament on the state of landslips caused by the working of salt, and classifies the Red rocks of Lancashire and Cheshire as follows:—(1) Keuper or Saliferous [Marl], with thin beds of limestone and 210 feet of rock-salt, 600 feet; (2) Lower Keuper, or Red Marls, with two beds of variegated sandstone, 500 feet; (3) Bunter, or Upper Red Sandstone, 900 feet; (4) Red Marls, valley of Irk, 210 feet, and Lower New Red Sandstone (Permian), 600 feet.

Mr. Dickenson suggests that the Permian Red Marls, sunk through in Hafod-y-bwch Colliery, Denbighshire, are in reality Carboniferous; he refers to the fact that the salt of Middlesboro' occurs at a depth of 300 yards beneath Red Sandstone, and believes that the streaked markings in the Marlstone were due to the sliding of overlying beds caused by the melting and flowing away of the salt to the sea. C. E. De R.

Egan, F. W. Explanatory Memoir to accompanying Sheet 47 of the Maps of the Geological Survey of Ireland, with Palæontological Notes by W. H. Baily. Pp. 57. 8vo. Dublin. (Five woodcuts, sections, and view.) [Published in 1874, though dated 1873.]

The ground is gently undulating, rising to 819 feet south of Armagh; the low grounds to the north around the Bann, Blackwater, &c., are covered with bog; and those rivers convey all the drainage into Lough Neagh. The formations are:—Bog, Alluvium, Drift, Miocene Clays, Keuper, Bunter, Permian Breccia, Lower Carboniferous, Lower Silurian (Caradoc or Bala), Basalt, Dolerite, and Felstone.

The limestone near Armagh affords some beds of handsome marble, extremely fossiliferous. Near the town occur Permian breccias (boulder-beds and conglomerates), described by Prof. Hull, and referred to the Lower Permian. The boulders appear to have been deposited by floating ice. Permian beds are also found on the Blackwater, near Benburb; and these are the only Lower Permian beds yet observed in Ireland. The Triassic beds occupy a considerable area in the north and west of the district, and underlie the city of Armagh, but are well exposed only in isolated localities. At the north a Tertiary lacustrine deposit of clays, with a little sand, is found, being the continuation of the clay-beds of Lough Neagh. Sometimes good white pipeclay is got, and, it is supposed, lignite at one place. These overlie the basalt, which spreads over a large area to the north and west around Portadown &c., with isolated patches near Markethill, and at Pointspass to the south-west. It is in general hard, dark grey and finely crystalline, very amygdaloidal and zeolitic, and weathers in spheroids. Prof. Hull gives "Microscopic Notes" of that near Ballyleny, which consists of a sub-crystalline augitic base, with many prisms of triclinic felspar (Labradorite); magnetite or titano-ferrite, olivine, and chlorite also are present. It is a fair sample of the basalts of the north-east of Ireland.

Mr. Baily furnishes "Palæontological Notes," with list of fossils, and fossil localities. He notices the absence of Goniatites, as well as Orthoceratites, in the Carboniferous Limestone—also the abundance of fish-remains in the Armagh marble, being for the most part palatal teeth and defence-spines of fish allied to sharks and rays, in general character corresponding to the fish-remains of the Carboniferous Limestone near Bristol and at Farlow. The memoir contains a "Detailed Description" of all the foregoing, and a short notice of the Drift. This consists of Lower Boulder Clay, with overlying sands and gravels; the latter contain occasionally fragments of shells and pieces of silicified wood. E. T. H.

Ellis, J. W. Note on the Stump-Cross Caverns at Greenhow, near Pately Bridge. Rep. Brit. Assoc. for 1873, Sections, p. 80.

These caverns were discovered in 1860 by miners searching for lead, at a depth of 9 fathoms from the surface. They are remarkable for the great beauty of their stalactites. W. T.

Etheridge, R. On the Geology of Coal and Coal Deposits in the British Islands. Report of Proceedings 11th Annual Meeting, British Association of Gas Managers, pp. 84–109.

Describes the range of Carboniferous rocks of Western Europe, and then refers in more detail to the British Coal-fields, giving for each area the results of the Coal-Commission Report, statistics of produce, quantity still remaining, &c. The "concealed Coalfields" are referred to, and the possibility of the existence of Coal Measures beneath the S.E. of England is discussed. The paper concludes with notes on the Flora of the Coal. W. T.

Etheridge, R., jun. Description of a Section of the Burdiehouse Limestone and connected Strata at Grange Quarry, Burntisland. Trans. Edin. Geol. Soc. vol. ii. part iii. pp. 273–276.

Describes a new exposure of the Burdiehouse Limestone at the Grange Quarry near Burntisland. The measures consist, in descending order, of:—1. A thick sandstone with fragmentary remains of *Lepidodendron* and *Stigmaria*; 2. Two beds of flaggy shales, separated by a thin course of black friable shale and containing species of *Lepidodendron*, *Eurynotus crenatus*, *Palæoniscus*, sp., *Leperditia Scoto-burdigalensis*, *Beyrichia arcuata*, and *Kirkbya annectens*; 3. Friable black shales with *Sphenopteris affinis*; 4. Limestone, 12–14 feet in thickness, with *Leperditia Scoto-burdigalensis* and *Stigmaria*-rootlets. H. A. N.

Fisher, [Rev.] O. [Letter] on the origin of the Estuary of the Fleet. Reply to Mr. Kinahan. Geol. Mag. dec. 2, vol. i. p. 190.

Gives further reasons for believing that the shore-line of the Fleet has not been formed by marine erosion. The shingle of the bank is slowly travelling inwards and encroaching upon the Fleet. W. T.

——. [Letter on] the Chesil Bank. Geol. Mag. dec. 2, vol. i. pp. 285, 286.

The author believes that currents store up an accumulation of pebbles beneath the bay, which, being within reach of unusual wave-action, are at times thrown up on the beach. The order of events along this coast has been:—1. Subaërial excavation of valleys. 2. Growth of forests now submerged. 3. Depression and formation of *Scrobicularia*-clays and low cliffs—probably the period of the 30-foot raised beaches. 4. Slight re-elevation and silting-up of some of the estuaries. W. T.

Fordham, H. G. Notes on the Structure sometimes developed in Chalk. Quart. Journ. Geol. Soc. vol. xxx. p. 43.

Describes a bed of concretionary chalk at Ashwell; and refers the parallel striæ to "an incipient crystallization arising from the formation of the concretions." W. T.

Furley, R. A History of the Weald of Kent, with an outline of the History of the County to the present time. Vol. ii. (in two parts), pp. xii, 935. 8vo. Ashford & Lond.

[Vol. i., published in 1871, contained "A Sketch of the Physical Features of the District," by H. B. Mackeson, pp. 423–437.]

Contains some scattered notices of the old Wealden ironworks, and of the scenery and ancient condition of the district. Pages 250–254 give a sketch of the formation and history of Romney Marsh, chiefly by Mr. James Elliott, illustrated by a map of the marsh copied from that by Mr. T. Lewin. W. T.

Gomersall, W. The Round-Boulder Hills of Craven. Rep. Brit. Assoc. for 1873, Sections, p. 80.

These hills of Boulder Clay lie between the rivers Aire and Ribble; their height above the base on which they stand varies from 100 to 300 feet. The highest are to the north and west of the group, whilst they gradually diminish to the south and east. W. T.

Goodchild, J. G. Note on the Carboniferous Conglomerates of the Eastern Part of the Basin of the Eden. Quart. Journ. Geol. Soc. vol. xxx. pp. 394–400 (section).

The author describes the section at Ash Fell, and compares it with that at Roman Fell on the N.E. side of the Pennine faults. At the former the beds are (in descending order):—*a*, carboniferous limestone with thin sandstones and shales (1000 feet); *b*, sandstone with fossiliferous shales and beds of limestone (500 feet); *c*, limestone (500 feet); *d*, shales with thin impure limestones passing down into conglomerate-beds, and then again passing into the drift-like beds which have elsewhere been described as Upper Old Red Sandstone. Division *b* and the lower part of *a* are represented along the Cross-Fell escarpment, but particularly at Roman Fell, by a series of sandstones and conglomerates (the "Roman-Fell beds"); these have been confounded with the true basement-beds, and have also been described as Old Red Sandstone. The author suspects that they may represent the Calciferous Sandstone of Scotland. It has been found that in the north-west of England the limestones of the Carboniferous series thicken towards the south-east, and that the drifted deposits thicken and become coarser towards the north-west. W. T.

GREENWOOD, Col. G. Origin of the Fleet. [Letter.] Geol. Mag. dec. 2, vol. i. p. 143.

Gives reasons for believing that the Chesil Bank is not due to tidal currents, but to the prevalent south-westerly winds, Portland preventing the onward passage of the shingle. W. T.

——. Why are the largest stones found at the east end of the Chesil Bank? Geol. Mag. dec. 2, vol. i. p. 576.

Between groins the largest pebbles are carried by the waves to the leeward end. Portland is a natural groin. Boulder Clay is formed, he thinks, by storms of wind washing out pebbles into the clays. W. T.

GUISE, Sir W. V. Annual Address, 1873. Proc. Cotteswold Nat. Field Club, vol. vi. pp. 63–80.

The author refers to a communication by Mr. Etheridge, giving some of the results arrived at by the Coal-Commission in reference to Gloucestershire and Somersetshire (pp. 64–69).

The various field-meetings are noticed, and the following subjects:—Dr. T. Wright's remarks on a new species of *Uraster* from the Forest Marble of Road, Wiltshire (pp. 71, 72); and the caves on the Great Doward, which have yielded large quantities of the teeth and bones of Mammoth, Rhinoceros, Lion, Bear, Hyæna, Irish Elk, &c., with flint knives and scrapers (pp. 72–75). H. B. W.

——. Annual Address, 1874. Proc. Cotteswold Nat. Club, vol. vi. pp. 91–104.

Refers to Mr. Lucy's paper on the submerged forest-bed near Sharpness (pp. 92–94). Notices the field-meetings, and refers to Prof. Buckman's paper, the object of which was to show that the Cephalopoda-bed of Dorset is the equivalent of the "Gryphite Grit" of Leckhampton and of the "Trigonia Grit" of Lineovers. The Professor further contended that the sands beneath the Cephalopoda-bed in Dorset, for at least 100 feet of their thickness, represent the Inferior Oolite beds of the mass of Leckhampton and Crickley Hills (pp. 95–98). Mr. Witchell's paper on the angular gravel of the Cotteswolds, in which he attributed its deposit to the action of rain and surface-drainage, but thought that in some instances it was brought down the slopes of the hills upon a surface of frozen snow, is also noticed (p. 98). H. B. W.

GUNN, JOHN. On the Probability of finding Coal in the Eastern Counties. (Norwich Geol. Soc.) Norwich Mercury, no. 8372,

p. 4; Norfolk News, no. 1521, p. 11; and Rep. Brit. Assoc. for 1873, Sections, p. 81.

The author advises a boring at Hunstanton, which would probably not exceed 1000 feet before touching Palæozoic rock, from the absence and thinning-out of beds, and from the Chalk having been upheaved 1700 feet from Yarmouth to that place, bringing the beds beneath so much the nearer to the surface. He also gives reasons for believing it probable that Coal Measures exist there. This paper has been published somewhat more fully in Proc. Geol. Assoc. vol. iv. p. 35 (1875). W. W.

Gunn, J. On the Pile-driving in Wroxham Little Broad, and the Illustration it affords of the mode of formation of the Valleys of the Bure and the Wensum. (Norwich Geol. Soc.) Norwich Mercury, no. 8390, p. 3.

The greatest depth to which a pile was driven through the marsh was 72 feet beneath the level of the water. The depth of water is about 8 feet; therefore the bottom of the water was once 66 [64] feet lower than now. The cause of this excavation is thought to be due to alternate elevations and depressions, during the former the excavating power of water being increased, and during the latter materials being deposited and turbaries formed, some parts remaining as broads. On either side of the valleys are the same formations, out of which the valleys have been scooped, which process the author thinks to be principally due to submersion under the glacial sea, aided afterwards by fluviatile and atmospheric action. The occurrence of flint-implements in the valley-gravels is noticed. W. W.

——. [Presidential Address to the Norwich Geological Society.] Norwich Mercury, no. 8445, p. 6.

Notices the finding of the largest known specimen of *Voluta Lamberti* (9 inches long) in Coralline Crag at Aldborough, and of a horn, apparently of an early form of *Cervus elaphus*, in the same bed at Gedsgrave. Alludes to the advantages of Hunstanton as a place for a trial-boring to find the Palæozoic rocks, remarking that the bore might begin there in Kimeridge Clay, which was not reached for 290 feet in the Netherfield bore. W. W.

Habets, A. Gisements d'hématite du pays de Furness et du Cumberland. [Hematite deposits of Furness and Cumberland.] Rev. Univ. des Mines, t. xxxvi. pp. 329-335, pls. 17, 18.

An abstract of a paper by M. Würzburger, read at the Meeting of the Iron and Steel Institute, Sept. 1874.

——. Recherches de houille, à Rampside, près de Barrow. [Search for Coal at Rampside, near Barrow.] Rev. Univ. des Mines, t. xxxvi. pp. 335–338.

An abstract of Mr. Brogden's paper read at the Meeting of the Iron and Steel Institute, Sept. 1874.

Hardman, Edward T. Note on a small raised Estuarine Beach at Tramore Bay, co. Waterford, showing traces of several oscillatory movements during the Recent Period. Journ. Roy. Geol. Soc. Ireland, ser. 2, vol. iv. pt. i. pp. 31–36 (woodcut); and Geol. Mag. dec. 2, vol. i. pp. 210–215.

The Bay of Tramore is cut off by a sand ridge from an old estuary. At various places around this, and at heights from 2 to 10 feet above high-water mark, traces of a raised beach are found—layers of sand and gravel, with recent shells, being found resting on Boulder Clay, vegetable soil, or, in one instance, peat-bog. At the southern corner of the estuary near the town there is a partially submerged and silt-covered bog. The author gives details and sections, and considers that the facts warrant the conclusion that there have been at least three oscillatory movements of depression and emergence, the peaty and vegetable layers denoting land-surfaces, the shelly gravels being shore-deposits. This seems to bear out the theory of Mr. T. M. Reade on the frequency of such former movements in the estuaries of the Mersey, Dee, and Ribble. The shelly gravels of Dundalk, and the peat and silt underlying Belfast, are doubtless due to similar causes, while a good instance is furnished by the estuary of Wexford, where thick peat is found under 16 feet of mud. E. T. H.

Harkness, Prof. R. On the occurrence of Faults in the Permian Rocks of the lower portion of the vale of the Eden, Cumberland. Rep. Brit. Assoc. for 1873, Sections, p. 81.

The composition of the Lower Permian rocks between Kirkby Stephen and Armathwaite is described. The strike of the beds here is N.N.W.; if this continued along the vale of the Eden the neighbourhood of Armathwaite and Ainstable would have been occupied by the Corby sandstones (Upper Permian); but the Penrith sandstones (Lower Permian) are here extensively developed. The author infers a N.E. and S.W. fault here, with an upthrow on the N.W. side. Other faults are described lower down the Eden, one of which brings purplish-white sandstones and grey shales, of Carboniferous age, near to the Upper Permian. W. T.

Harmer, F. W. The result of the Geological Survey of the Eastern Counties by Mr. S. V. Wood, Jun., and himself. (Norwich Geol. Soc.) Eastern Daily Press, April 11.

Mr. Harmer exhibited a geological map, on the scale of an inch to the mile, and a number of sections illustrative of the structure of the Crag and Glacial beds of the district. The remarks made were a summary of the paper on the Upper Tertiaries of the east of England, published by the Palæontographical Society in 1873. F. W. H.

Hawes, William. On the Channel Tunnel. Journ. Soc. Arts, vol. xxii. pp. 397–408 (see also p. 437).

Notices works done under the sea. Discusses Mr. Prestwich's idea of driving a tunnel through the Palæozoic rocks, and dismisses it as impracticable, as also the idea of driving it through the London Clay, and advocates the course through the Lower Chalk as the only possible one. A long discussion follows the paper. W. W.

Hébert, Prof. E. Comparaison de la Craie des Côtes d'Angleterre avec celle de France. [Comparison between the Chalk of England and that of France.] Bull. Soc. Géol. France, 3e sér. t. ii. pp. 416–428.

In a table the author thus states the parallelism between the divisions of the Chalk of the Kentish coast and his own:—

English Divisions.	French Divisions.	
F. Chalk with much flint and many fossils. 2. Margate Chalk *. 1. St. Margaret's Chalk.	Chalk with *Micraster coranguinum*.	
E. Chalk with much flint and many fossils.	Chalk with *Micraster cortestudinarium*.	
	Chalk with *Holaster planus*.	
	Upper zone,	Chalk with *Inoceramus labiatus*.
D. Chalk with few flints.	Middle zone,	
C. Chalk without flints, with many fossils.		
B. Chalk without flints, and few fossils.	Lower zone,	
A. Chalk Marl, Grey Chalk, U. Greensand.	Glauconitic Chalk.	

G. A. L.

Henderson, J. On some Sections of Boulder-clay, Peat, and Stratified Beds exposed in a Quarry recently opened at Redhall, Slateford, near Edinburgh. Trans. Edin. Geol. Soc. vol. ii. part iii. pp. 391–395.

Describes and illustrates by a section the superficial deposits exposed at the locality mentioned. H. A. N.

Henwood, W. J. Observations on the Detrital Tin-ore of Cornwall. Journ. Roy. Inst. Cornwall, no. 15, pp. 191–254. (Traduction par extraits in Ann. des Mines, 7e sér. t. vi. pp. 114–130, with a note by the Author on the localities where gold has been found in Cornwall.)

These deposits in Cornwall and Devon have been worked for ages, and are now nearly exhausted. This paper refers chiefly to those few still in progress. A description of the lodes is given, and of some areas (as near St. Austell) in which tin-ore occurs scattered through the granite. The granitic gravel containing pieces of tin-stone, which occurs in valleys draining the tin-bearing districts, is called "tin-ground," The several workings in these valleys are described. The largest body of stream-tin wrought of late years is near Restronguet Creek, in the Camborne granitic district; this is worked by open cuttings and also by shafts 50 or 60 feet deep. Near Tregedna the stream-tin deposit is overlain by from 20 to 30 feet of mould and hardened silt.

The débris of the bed beneath the tin-ground always prevails in it.

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* This is a mistake. The Margate Chalk contains very few flints, and is not included in division F, being above it. W. W.

Other ores than tin occur. The proportion of tin-ore in one of the newest works scarcely exceeded that in one of the poorest lodes; but the metal from the stream-ore is the best. Gold has been found, but very sparingly, in the detritus of every tin-district.

The blocks and smaller fragments on the tin-ground show marks of abrasion; and the interstices are filled with sand and clay. The bed that rests on it is scarcely distinguishable from it, except that its ingredients are perhaps less abraded, and that it is almost destitute of tin-ore. The bed next above this has a likeness in neighbouring valleys, and yet sometimes differs in different parts of the same valley: it seems that after the tin-ground was deposited timber sometimes flourished in the lower valleys, and brushwood in the upland glens, subsequent change in the relative levels of land and sea affecting the former more than the latter, and that the deposit of barren débris was once or twice interrupted by a large formation of peat. Vegetable remains of the same kind occur within short vertical distances from the "tin-ground" both north and south of the watershed.

The deep valleys which formerly opened to the sea below high-water mark, on the south coast, contain alternations of mineral with vegetable matter, and of freshwater with saltwater deposits.

Detitral tin-ore does not occur only (though chiefly) in the low grounds, but has also been found in abraded masses on the slopes of hills, whence it has been traced to the parent lodes.

If detrital tin-ore has also been deposited in the sea, it must be covered, as on land, by more recent deposits, soundings having failed to find it. At Cligger Head the ore derived from the waste of the cliffs is collected.

The paper concludes with three tables, giving the composition of the tin-ground and of the adjoining and neighbouring rocks, the comparison of vegetable remains in the upper and lower parts of the same and of different valleys, and the mineral composition and organic contents of the beds laid open in various stream-works.

Throughout is a very large number of footnotes, giving references to the many works on the district. W. W.

Hicks, H. On the Arenig and Llandeilo Rocks of St. David's. Rep. Brit. Assoc. for 1873, Sections, p. 82.

This paper is a continuation of a previous one, and completes the description to the top of the Llandeilo series. The *Lower Arenig series* occurs as black slates and flags, about 1000 feet thick; and it contains many species of dendroid Graptolites and Trilobites peculiar to this group. The *Upper Arenig series* occurs as fine-grained, soft, black shales, 1000 feet thick; and all the fossils are distinct. The *Lower Llandeilo series* consists of black slates and hard grey flaggy sandstones with siliceous schist and beds of felspathic ash at the lower part, and of dark slates and flags with many calcareous bands in the upper part; about 1500 feet thick. The *Upper Llandeilo series* consists of black slates and flags, several thousand feet thick.

All these divisions are conformable with each other. The author doubts whether any other spot hitherto examined in Britain could show so continuous a section of these rocks; still he believes that there is ample evidence to prove, from researches made in other parts, that the succession here made out was, in most of its important details, capable of being applied to many other districts. The most characteristic fossils of the various divisions are named. W. T.

Hicks, H. On the Cambrian and Silurian rocks of Ramsey Island, St. David's. Proc. Geol. Assoc. vol. iii. no. 4, pp. 155–157.

The lowest beds are the Lingula Flags, consisting of sandstones and slate, about 600 feet thick, and showing signs of having been deposited in shallow water. On this formation rests conformably the "Tremadoc group," passing up from the flags into a thick-bedded rock, and containing abundant fossils throughout (1000 feet). Conformably on the Tremadoc rocks the "Lower Arenig" succeeds, with a rich fauna of Graptolites. The section (of the northern end of the island) shows that there is no considerable break between the Cambrian and the Silurian. W. W.

Hobkirk, C. P. On the Mosses of the West Riding of Yorkshire. Rep. Brit. Assoc. for 1873, Sections, pp. 104, 105; and Journ. Bot. n. s. vol. ii. p. 327.

The paper is prefaced by a short introduction descriptive of the principal geological features of the district. The various river-basins are described; those of the Wharfe, Upper Aire, and Calder have been most searched. The distribution of nearly 300 species, so far as known, is given. W. T.

Hopkinson [John]. Excursion to Eastbourne and St. Leonards. Proc. Geol. Assoc. vol. iii. no. 5, pp. 211–214.

Notices the cliff-section from Eastbourne to Beachy Head, the Old Roar quarry (in Wadhurst Clay) with its bone-bed and leaf-bed, the submerged forest near Bulverhithe, &c. W. W.

Horne, J. A Sketch of the Geology of the Isle of Man. Trans. Edin. Geol. Soc. vol. ii. part iii. pp. 323–347, with Plate and woodcuts.

Discusses the subject under the following heads:—1. Previous Literature; 2. Silurian Rocks; 3. Calciferous Sandstone Series; 4. Carboniferous Limestone Series, comprising the Lower or Castletown Limestone Group, the Upper or Poolvash Limestone Group, and the Poolvash Black-Marble Beds; 5. Igneous Rocks; 6. Glacial Phenomena. Under this last the author treats of the Glaciation of the low grounds of the island, the Till and Boulder-clay with interglacial beds, the Kame series, the shelly clays and stratified sands and gravels, and the moraines. H. A. N.

Howell, James. On the Geology of Brighton. Part I. Proc. Geol. Assoc. vol. iii. no. 4, pp. 168–188.

The author notices the features of the South Downs and of the coast, and the distribution of the beds; then treats of the recent changes of the coast, the loss of land that has occurred and its prevention by groynes, and notes the occurrence of a "submerged forest" along the sea-line. The various beds are then described, beginning with the newest, the silt of the Brighton valley, which is inferred to have been deposited in an estuary; the flotation of large stones by seaweed is here noticed. The next bed is the Post-Pliocene brick-earth of Hove, the materials of which the author thinks were derived from the denudation of the older Tertiary formations. The last deposit noticed is the "elephant-bed" or "combe rock," also of Post-Pliocene age, which consists of fragments of chalk and flints, with some other stones, about 50 feet thick, and is underlain by an old sea-beach and sand. The combe rock is inferred to have been deposited gently under water, in a shallow bay or estuary. W. W.

Hudleston, Wilfrid H. The Yorkshire Oolites. Part I. Proc. Geol. Assoc. vol. iii. no. 7, pp. 283–333, 8 woodcuts (sections).

The district described is high land in the N.E. part of the county, with escarpments on the west overlooking the Triassic plain, and on the east bounded by the sea-cliffs. The beds, as a whole, are sandy, pure limestone being rare; but there is great difference between the coast section and the inland sections, the sandy and clayey lower beds being thickest to the N.E.; whilst the limestone-beds are, as a rule, thickest to the S.W. The general shape of the ground and the lie of the beds is described, and the connexion of the two noticed.

In the Lower Oolites there are four fossiliferous zones, best developed on the coast—"Dogger" (lowest), "Millepore Bed," "Scarborough Limestone," and "Cornbrash." The Blue Wyke Point section is described in detail, showing, below the Dogger, "yellow sands," "grey sands," and "*Striatulus* beds." The chief fossils of each are noticed.

The Dogger, which has a maximum thickness of 80 feet, as a whole is a sandy ironstone, partly oolitic in structure. There are in it nodules of a phosphatic character; and in some cases the ironstone has been formed through the replacement of lime by iron. In Rosedale the Dogger and associated beds have been largely worked for iron, the "magnetic ore" containing over 48 per cent. of metallic iron, peroxide and protoxide in about equal proportions.

The "lower shales and sandstones" come next (ascending), and reach a thickness of 280 feet.

The Millepore-bed is sometimes a ferruginous sand rock with bands of ironstone, poor in lime; but in other parts it contains limestone. It is up to 43 feet thick.

The "middle shale and sandstone" which succeeds is the principal carbonaceous series of the Lower Oolites, and reaches a thickness of 100 feet.

The Scarborough Limestone consists of marine and estuarine beds, up to 50 feet thick, with shale (calcareous or not) and ironstone. The sections at Hundale and White Nab are described in detail.

The "upper shale and sandstone" is the next division, with a thickness varying up to 160 feet, and contains much hard siliceous rock. Its fossils are estuarine and freshwater; and in the crevices of the rocks the hydrous silicate of alumina known as Scarbroïte is often found.

The Cornbrash, the highest fossiliferous zone, is perhaps the richest also, although (with its shale) it reaches only a thickness of 13 feet.

The above thicknesses are taken from the coast-section, and amount to a total of 695 feet. The Derwent-Valley section (inland) is noticed in detail for comparison; and here the beds are much thinner (under 200 feet) and different in composition. The Whitwell limestone of this part, which is the nearest approach in N. Yorkshire to the Midland type of Inferior Oolite, has been correlated with the Millepore-bed of the coast.

There are some lists of fossils in the paper, and analyses of ironstone &c. W. W.

Hughes, Prof. T. M'K. Exploration of Cave Ha, near Giggleswick, Settle, Yorkshire. Journ. Anthrop. Inst. vol. iii. no. 3, pp. 383–387, with plate (sections).

The cave-floor was mould with pellets of owls, kestrels, &c., beneath which was earth with much mould, pottery, flint-flakes, knives, a stone bead, and bones of recent species, including many remains of mice. The bed below was powdery travertine, covering fragments of limestone cemented into a breccia, with no human relics and but few bones. One molar of bear was found. F. W. R.

Hull, Prof. E. The Volcanic History of Ireland (Anniversary Address). Journ. Roy. Geol. Soc. Ireland, ser. 2, vol. iv. part i. pp. 20–31, with woodcut; and Geol. Mag. dec. 2, vol. i. pp. 145–150, 205–210.

The address first refers to the papers read before the Society during the Session. As regards volcanic phenomena generally, the author states that neither faults nor earthquakes are necessarily connected with volcanic action. Trap-dykes are later than the beds they traverse; and sheets of trap are not always contemporaneous with the beds amongst which they lie. The only certain evidence of contemporaneous volcanic action is that afforded by ashes, agglomerates, and other *ejecta*.

The volcanic rocks of Ireland belong to the Palæozoic and to the Tertiary divisions. Of the former there are many examples in the *Lower Silurian rocks*, as in the counties of Wicklow, Wexford, and Waterford—Stradbally and Kill, in the last, seeming to have been *foci* of volcanic action. Similar volcanic rocks occur north of the Boyne, and, less frequently, in Down, Armagh, and Cavan. They are all of marine origin, and have a marked resemblance to those of North Wales. In the Galway district Mr. Kinahan considers that similar rocks occur, but much altered. These volcanic rocks are felspathic and highly silicated. The *Upper Silurian rocks* also show evidence of contemporaneous action, as in West Mayo and Galway on the north of Killary Harbour and Lough Mask, another centre of volcanic activity being shown at the promontory of Dingle. In the *Old-Red-Sandstone* period there are several examples—near Boyle, Co. Roscommon, in the Killarney Mountains near Lough Guitane, at Lough Garagarry, The Devil's Punch Bowl, and Crohane, &c.; also at Cod's Head and Dursey Island, and on the shores of Lough Kay and Valentia Harbour. *Lower Carboniferous* Volcanic Rocks are well shown in the Limerick Basin, and belong to two periods of eruption. Microscopic examination shows them to belong, with few exceptions, to the old augitic lavas, or "melaphyres," the base being triclinic felspar, enclosing crystals of augite, olivine, magnetite, and grains or bands of chlorite. To the same period belong the volcanic rocks of Bantry Bay. To the Tertiary period belong the great sheets of augitic lavas occupying the N.E. of Ireland, extending to the west of Scotland and Inner Hebrides, and referrible to three periods. The earliest eruptions were those of highly silicated lavas, trachytes, rhyolites, and pitchstones, the old vents of which are found near Hillsborough and also among the hills N.E. of Antrim. These preceded the Miocene basalts, and are probably of Upper Eocene age. Then, after a period of repose, a flow of augitic lavas, basalt, &c. took place, one of the vents being Scrabo Hill, Co. Down. Another cessation then occurred, during which the valuable beds of lithomarge and iron-ore were formed under lacustrine waters. Lagoons also existed; and beds of lignite were formed. The plants of these are of Miocene age, establishing the coincidence in time of the basalts with that of Mull and the Hebrides. The third outflow now took place, great sheets of basalt, sometimes 400 or 500 feet thick, being poured out. The principal necks of this period may possibly be those of Dunluce and Sleamish; and this outburst was accompanied or followed by the protrusion of dykes, cutting through both old and new sheets. All these volcanic operations seem to have been subaërial. The subsequent denudation has been enormous. E. T. H.

Hunter, —. Vertical Section of Carboniferous Strata, West of Scotland. Part i. 27 pp. 8vo. Carluke.

A detailed section of 642 separate beds from the New Red to the Old Red Sandstone. Local names are given; and beds in which fossils have been found are noted. G. A. L.

Irving, Rev. A. On the Geology of the Nottingham District. Geol. Mag. dec. 2, vol. i. pp. 314-319.

Has since been published in full in Proc. Geol. Assoc. 1875.

Jamieson, T. F. On the Last Stage of the Glacial Period in North Britain. Quart. Journ. Geol. Soc. vol. xxx. pp. 317–337 (woodcuts).

There are three well-defined stages in the history of the Glacial Period of Scotland:—1. the great glaciation by land-ice; 2. submergence and the formation of glacial marine beds; 3. the period of the later glaciers. It is chiefly with the last that this paper is concerned. Its object is to show that the development of ice and snow during the third period must have been far greater than is generally supposed. Local glaciers will not suffice to explain the facts; a great ice-sheet must have spread over nearly the whole of Scotland and

Ireland, and over the greater part of England. The later ice-sheet was thinner and less enduring than the earlier; for it has not destroyed all the glacial beds produced during the second period. The ice-sheet gradually shrank into valley-glaciers. Where the retreat of the ice was rapid, no marginal deposits were formed; but where there were pauses in the retreat of a glacier, kaims, eskers, and moraines have been left. The author enters into some detailed arguments to show that eskers are not marine, but are more likely to have been formed at the end of a glacier. The gravel-terraces along the river-valleys are believed to be glacial, formed when the centre of a valley (or the bed of a stream) was occupied by a glacier; into the hollows between the glacier and the hills gravel would be washed down. The glaciation of the western coast of Scotland has been more extreme than that of the eastern coast. Far more rain falls on the west coast than on the east coast; and the author infers that a like distribution of snow occurred during the glacial period. W. T.

JOLLY, W. Second Report on Fossils from localities of difficult access in North-Western Scotland. Rep. Brit. Assoc. for 1873, p. 412.

Fossils have only been found near Durness; these have not yet been determined. It is desirable that search should be made along the strike of the limestone between Eribol and Skye. W. T.

JONES, Prof. T. R. Water Supply and "Divining Rods." Geol. Mag. dec. 2, vol. i. p. 579.

Notes the occurrence of the Oyster-bed of the Woolwich and Reading series at Bussock Camp, three miles N. of Newbury. This was found in sinking a well, in which no water was obtained. The spot had been chosen by means of the divining-rod, by an expert, "who had the reputation of having been most successful at Sandleford, near Newbury!" W. T.

JUDD, J. W. The Secondary Rocks of Scotland. Second paper. On the Ancient Volcanoes of the Highlands, and the Relations of their Products to the Mesozoic Strata. Quart. Journ. Geol. Soc. vol. xxx. pp. 220–301, plate (map and sections).

There have been two great periods of volcanic activity in Scotland —one, extending from the commencement of the Old-Red-Sandstone period down to the close of the Palæozoic era, the other during nearly the whole of the Tertiary period. During each of these volcanic periods a great extent of continental land appears to have existed in the same areas. During each volcanic period the extension of felspathic lavas has preceded that of the basaltic varieties: in the case of the Palæozoic volcanoes the transition from one kind to the other appears to have been gradual; with the Tertiary volcanoes, however, the eruption of highly silicic lavas was followed by an interval of rest, after which highly basic rocks were ejected from the same vents. The older volcanoes ranged N.E. and S.W., coinciding with the direction of the main axis of upheaval. The Tertiary volcanoes ranged N. and S. There appears to have been no volcanic outburst in Scotland during the Secondary period; but the author believes that the pent-up volcanic forces manifested themselves in great and frequent oscillations of level of the land, thus accounting for many anomalous characters presented by the Secondary rocks of the district. Only small patches of such rocks are preserved, these having been saved from denudation by the protecting Tertiary volcanic sheets.

Tables of the average composition of the Tertiary volcanic rocks are given. The highly crystalline form of the acid series is granite, the glassy form is obsidian; the crystalline form of the basic series is gabbro, the glassy form is tachylite: in each series there are numerous intermediate varieties. The felspathic lavas have rarely extended more than 10 miles from their points of eruption; the basaltic lavas, however, have spread in vast sheets for 50 or 60 miles from their centres. Both varieties assume columnar characters, the latter most strongly so. W. T.

JUDD, J. W. Existence of Carboniferous Rocks in the Highlands of Scotland. Geol. Mag. dec. 2, vol. i. pp. 573, 574.

The author has found sandstone, shale, and coal, with Carboniferous plants, near Morven, on the northern side of the Grampian axis. The interest of the discovery lies:—1st, in the proof of the great extension of Carboniferous strata; 2nd, in the proof of enormous denudation preceding the outpouring of the Tertiary lavas; 3rd, in giving a base to the series of Poikilitic (Permian and Triassic) rocks of the Highlands; 4th, in adding another member to the series of rocks represented in the Highlands, which now embraces representatives of all the great geological formations except the Upper Silurian. W. T.

KERR, C. M. An Excursion of Mr. Wilson's Geological Class to Mount Sorrell. Rep. Rugby School Nat. Hist. Soc. for 1873, pp. 7-9.

The soil produced by the decomposition of the syenite was noticed to be thick; and there is also Glacial Drift. Some of the sections are briefly noticed. W. W.

KINAHAN, G. H. On the Origin of the Lagoon called The Fleet, Dorsetshire. Geol. Mag. dec. 2, vol. i. pp. 50, 51; see also Letters, pp. 189, 239, 240.

The author describes certain lagoons, marshes, and reclaimed lands on the coast of Ireland. He believes them to have been formed as follows:—Tidal currents running nearly parallel to a coast-line, in which there are rocks of unequal hardness, will denude the softer rocks into bays; shoals form between the headlands, due to the meeting of currents of water in the bay with the water outside; a slight rise of the land will convert these shoals into bars with lagoons behind them. Such, he believes, has been the origin of the Chesil Bank and the Fleet.

He thinks that shingle-beaches depend much on the tides, and but little on prevailing winds, and supports his arguments by examples from the coast of Ireland. W. T.

Kinahan, G. H. Glacialoid or Rearranged Drift. Geol. Mag. dec. 2, vol. i. pp. 111–117, 168–174.

There have been four marked changes of level in Ireland since the great Glacial period. The oldest is that of the Eskar Sea, or the 300-feet sea-beach; the second is marked by the 100-feet beach; the third by the 25-feet beach; at the fourth period the land was at least 30 feet higher than now. The subsequent depression, by which it was brought to its present level, appears to be still in progress in certain places. The accumulations of the three periods of depression are very similar. The fossils have hitherto been grouped together; but the author thinks that, when worked out, those from different beds will be found to differ.

It has been supposed that there has been in Ireland a later Glacial period, the Boulder Clay of which overlies the gravelly and other accumulations just noted. The author thinks that this is not the case, and regards the supposed Boulder Clay as a "glacialoid or rearranged drift." One peculiarity of this drift is that the stones are frequently set on end or arranged obliquely. Illustrations are given of how marine erosion is now rearranging Boulder Clay on the west coast of Ireland; a similar action is supposed to have formerly occurred in Wicklow and Wexford. Meteoric erosion also produces rearranged drift.

During the eskar-sea period small local glaciers seem to have existed, which sent down their detritus over the shelly drifts; but these deposits are unimportant. Reference is made to the submarine forests, and the proof that these are really due to depression. Postglacial faults affecting the drift are frequently mentioned. W. T.

——. Geology of West Galway and S.W. Mayo, Ireland. Geol. Mag. dec. 2, vol. i. pp. 453–462 (woodcut).

This paper is an epitome of one read at the British Association, 1874, which gave an account of the progress of the Geological Survey during the past seven years. The newest rock of the district is Carboniferous Limestone, which extends in a curved line from Clew Bay to Bantry Bay: there are small outliers of the Lower Carboniferous rocks (sandstones, conglomerates, &c.); but these are feebly developed. The next rocks, in descending order, are Upper Silurian; of these there are two distinct types; and local names are given to the subdivisions of each. Both series contain interbedded felstones, and both rest unconformably on rocks which are more or less altered. The metamorphism of the rocks underlying the south-western area is often great, some of them having lost all traces of sedimentary character and being changed into granite. The older rocks of the north-eastern area are less altered; fossils have been discovered in them which prove that the "Doolough beds" are of Lower Silurian or Cambro-Silurian age. It is believed that the highly altered rocks are of the same age, and that they lie in a great undulatory anticlinal curve which rises towards the west and exposes the lowest beds near the Atlantic. Sections of these beds are given.

It is evident that the granite is the product and not the cause of metamorphism; for there is a complete gradation from schists through gneiss to granite. There are, however, other granites which are clearly intrusive; these are "of two ages, one being pre-Llandovery but post-Cambro-Silurian, and the other post-Llandovery and probably pre-Wenlock." The Plutonic rocks are felstones and whinstones; each are of five different ages, the newest whinstones being Carboniferous. The oldest of each are metamorphosed.

The faults are traced out in detail, and they are shown to coincide with the main valleys. One of the most continuous faults is post-glacial; the others are of various ages, some being probably Cambro-Silurian. The paper concludes with a summary of the facts observed and the inferences drawn. There is no record in this area of any events between the Carboniferous and the Glacial periods. W. T.

Lobley, J. L. Excursion to Malvern. Proc. Geol. Assoc. vol. iii. no. 6, pp. 269–280.

Notices the chief geological features of the district, mentions Ragged-Stone Hill as the roots of a volcano of Cambrian age, and notes the occurrence of fossils in Upper Keuper Sandstone near Berrow. W. W.

Lucy, W. C. Glaciation in West Somerset. Geol. Mag. dec. 2, vol. i. pp. 255, 256.

The author describes the rounded hill-tops near Dunster, Porlock, and Minehead, also the detrital deposits of clay and gravel on the slopes of these hills. The general contour of the country and its drifts he considers suggest the agency of ice. Near Ashley Lodge he discovered a mass of sandstone distinctly glaciated. W. T.

——. The Submerged Forest, Holly Hazle, Sharpness. Proc. Cotteswold Nat. Club, vol. vi. pp. 105–125.

The author first gives an account of the submerged forests which have been described at Cromer, Hull, and Porlock; and he then refers to sections recently opened up in forming the new docks at Holly Hazle. These exposed a bed of peat, of a maximum thickness of 14 feet, and composed mainly of oak, alder, beech, and hazel. It is overlain by about 8 feet of fine silt, and it rests upon a potter's clay, which again overlies the Red Marl. The bottom of the peat is about the height of mean low water-mark in the Severn. The author points out the physical changes which are indicated by the submerged forest and the deposits now associated with it. H. B. W.

Mackintosh, D. On a New Section of Pre-Glacial White Clay and Sand near Mold [Flintshire]. Geol. Mag. dec. 2, vol. i. pp. 67, 68.

The section is near Colomendey Hall. It shows gravel and clay, the latter containing scratched and striated stones, overlying white clay and sand, which rests on Carboniferous Limestone. The deposits lie in a basin about 300 yards in diameter. The author alludes to the opinion that such white clays are the residue of limestone, the calcareous matter of which has been dissolved; and he refers to a boring lately made near Mold, in which a similar order of beds was found; but here the white clay rested on Coal Measures. He believes the clay to be of freshwater origin. W. T.

Mackintosh, D. Scotch Granite on Welsh Hills. Geol. Mag. dec. 2, vol. i. p. 95.

Asks for information regarding the reported occurrence of Scotch granite on the Welsh mountains up to 2000 feet above the sea.

——. Glaciation of West Somerset. Geol. Mag. dec. 2, vol. i. pp. 334, 335.

Referring to Mr. Lucy's paper (see p. 25) the author states that the supposed glacial grooves on the banks of the Exe are due to weathering. He then refers to the curved-back slaty laminæ which are common in West Somerset, and which he believes to have been produced by the passage of land-ice. He remarks upon the absence of striated surfaces south of a line drawn from the mouth of the Tees, past Ickley, to Hope Mountain, near Wrexham. W. T.

——. On the Traces of a Great Ice-sheet in the Southern Part of the Lake District, and in North Wales. Quart. Journ. Geol. Soc. vol. xxx. pp. 174–179 (map).

A tabular statement of the ice-marks is given. The author believes that the primary striæ must have been produced by an ice-flow capable of ignoring the drainage of the country to a much greater extent than could have resulted from any system of confluent glaciers strictly so called. The movement of the ice-sheet is inferred to have been from about N.N.W. to S.S.E.

The striated and mammillated rocks near Snowdon are described. The author believes that they indicate an ice-sheet travelling to the south and south-east. W. T.

——. Additional Remarks on Boulders, with a particular reference to a Group of very large and far-travelled Erratics in Llanarmon Parish, Denbighshire. Quart. Journ. Geol. Soc. vol. xxx. pp. 711–721.

The boulders occur on plateaux 1300 and 1800 feet above the sea, and are of great size, considering the distance they have travelled along lines of dispersion crossing the drainage of the country, and running up sloping ground, the largest being at the limit, some occurring at a height of 1900 feet. C. E. De R.

Mann, E. Geological Expedition to Atherstone and Nuneaton. Rep. Rugby School Nat. Hist. Soc. for 1873, pp. 19–22.

Notices sections of Millstone Grit, with intruded greenstone.

Mansell-Pleydell, John C. Flora of Dorsetshire . . . . with Sketches of its Geology and Physical Geography. Pp. 5–27. (Map of Districts founded on River-drainage.)

The same as the paper in Geol. Mag. vol. x. pp. 402, 438 (1873). "Drainage" is also treated of, pp. 27–32.

Marshall, David. Notes on a Visit to Connorree Copper and Sulphur Mine, County Wicklow, Ireland. Trans. Edin. Geol. Soc. vol. ii. part iii. pp. 282–285, 1 plate (section).

Contains an account of the geological features of the Connorree Mine in the Vale of Avoca, Ireland, together with some details as to the working of the mine. H. A. N.

Maxwell, L. Geological Section (Report of). Rep. Rugby School Nat. Hist. Soc. for 1873, pp. 64, 65 (plates).

Three sections of "the Oolitic Drift at Brownsover" are given. The beds are gravel and sand, arranged in a sort of basin. Four other sections in gravel, sand, and clay (Bilton) are noticed. W. W.

Maynard, Capt. John. Remarks on two Cross-sections through Carn Brea Hill and the neighbouring Mines. 41st Ann. Rep. Roy. Cornwall Polytech. Soc. pp. 189–203; and Rep. Miners' Assoc. Cornwall and Devon for 1873, pp. 43–54 (with 8 plates).

The sections, which pass through the most important mining-districts of Cornwall, show the lodes, elvans, and the undulating junction of the granite and killas, and afford evidence of the fact that lodes abound where elvans are numerous. C. L. N. F.

Meadows, J. M'C. The Leinster Coal-field. Journ. Roy. Geol. Soc. Ireland, ser. 2, vol. iv. pt. 1, pp. 10–20 (map), and Geol. Mag. dec. 2, vol. i. pp. 97–107.

The quantity of coal in this field is estimated at 75,000,000 tons. Lying at the junction of Tipperary, Kilkenny, and Queen's County, its greatest length is about 20 miles, and its width 15. A considerable part of this area is occupied with lower beds devoid of coal-seams. The beds dip towards a common centre; and the central portion was once occupied by the celebrated "Kilkenny Coal," now nearly exhausted; but that part of the "Jarrow" coal next in succession is untouched, and must prove the principal source of future supply. The upper and lower coals are described, and two sections given of the seams at the east and west of the field, from which it appears that there are seven or eight workable coals, from 1 to 4 feet thick. The output is about 80,000 tons yearly; sixty years ago it was 170,000 tons. The coals are all anthracitic and smokeless, with high heating power. The author controverts the view of the Geological Survey, that the external seams do not underlie those of the central basin, but are the same brought down by a fault, and adheres to Griffiths's classification, believing them to be distinct seams. E. T. H.

Mello, Rev. J. M. The Midland Coal Field. Pp. 135–140 of "The Derbyshire Red Book," with map and section. 8vo. Derby.

The author notices the probable former continuity of some coal-fields which have since been separated through upheaval and denudation, describes the extent of the Midland coal-field (half of which is concealed by overlying beds), notes the estimates that have been made of its probable underground extension eastward, and gives an account of the Derbyshire Coal Measures and of their associated bands of ironstone, with a vertical section of the beds. W. W.

Meyer, C. J. A. On the Cretaceous Rocks of Beer Head and the adjacent Cliff-Sections, and on the Relative Horizons therein of the Warminster and Blackdown Fossiliferous Deposits. Quart. Journ. Geol. Soc. vol. xxx. pp. 369–393 (section).

The author describes in detail the section at Beer Head, noting the mineral character and fossil contents of each bed. The lowest bed rests on New Red Marl; it is about 3 feet thick, of greenish sandy clay, containing near the base fragments of the underlying rock. Its prevailing fossil is a small variety of *Exogyra conica*. The age of this is doubtful; but above it there is sandy Gault, the lower part of which (together with the bottom bed just mentioned) the author regards as representing the Blackdown Beds. The true Upper Greensand is nearly 90 feet thick; the Chert Beds are near the middle. Above this is the Chloritic Marl, which the author regards as representing the Warminster Beds. The Chalk Marl rests on an uneven surface of Chloritic Marl. Above this come the Beer Stone, Lower Chalk (containing flints in its middle and upper portions), Middle Chalk (partly without flints); lastly there is White Chalk with numerous flints, which may possibly represent the Upper Chalk. The author suggests that the term "Upper Greensand" should be applied only to beds between the Gault and the Chloritic Marl, and that the Chloritic Marl should be considered a distinct deposit. W. T.

Neilson, **James**, jun. On some Sections of Carboniferous Limestone near Busby. Trans. Geol. Soc. Glasgow, vol. iv. part iii. pp. 282–290.

These sections, situated about 7 miles S. of Glasgow, consist of thin alternating beds of limestone, shale, ironstone, and volcanic ash. From a comparison of the fossils found (of which a full list is given, with no new species) the author says there can be no doubt as to the equivalency of the beds described to the Hosie limestone series on the South Hill of Campsie. G. A. L.

Nicholas, Dr. **Thomas**. The History and Antiquities of Glamorganshire and its Families. Section ii. Geology and Mineralogy, pp. 21–24. Large 8vo. London.

Painter, Rev. W. H. Holiday Rambles.—No. I. A visit to Castleton. Science Gossip, no. 117, pp. 195–197.

Notices the caverns of the peak, and gives five woodcuts of carboniferous fossils. W. W.

Pankhurst, [E. A.]. On the Geology of Derbyshire. 21st Ann. Rep. Brighton Nat. Hist. Soc. pp. 99–104.

Notices the weathered rocks, the tufa, the toad-stone, and the veins.

Payne, W. On the Coalfield of Brora, Sutherlandshire. Trans. Edin. Geol. Soc. vol. ii. part iii. pp. 368–371 (abstract).

Describes the general characters of the Brora Coalfield, giving analyses of the coal and accompanying ironstone. H. A. N.

PENGELLY, W. Ninth Report of the Committee for Exploring Kent's Cavern, Devonshire. Rep. Brit. Assoc. for 1873, pp. 198–209.

This report refers chiefly to work done in the "Long Arcade," or "Corridor." Earlier explorers having disturbed some parts of this gallery, an account of its original condition is compiled from Mr. MacEnery's description. It was formerly thought that the circular hollows which had been observed in the stalagmitic floor of the arcade were the beds of bears, or had been made (perhaps for hearths or ovens) by the early inhabitants of the cave. In the Eighth Report certain natural basins, resembling these hollows, were described; and during the past year a larger hollow was discovered which, without any doubt, was natural. An inscription, dated 1604, has been discovered in the stalagmite; this is the earliest yet noticed.

The stalagmitic floor is of two kinds, granular and crystalline; the latter is by far the older, and, in the Long Arcade, is only found in patches adhering to the north wall, at a higher level than the newer granular floor. The oldest deposit yet known in the cave is the *breccia*, which has yielded remains of the bear and flint implements of a rude type. Above this the *crystalline stalagmite* accumulated. At a subsequent period these deposits were partially dislodged; the *cave-earth* was introduced, and above that the *granular stalagmite* was formed. The conditions under which the breccia and the cave-earth respectively were formed must have been widely different; and the time which must have elapsed between the periods is believed to have been considerable. The breccia contains materials which could not have been derived from the Cavern-hill; and it is suggested that it was introduced into the cavern from some opening yet undiscovered. "The fact that though he [the Hyæna] was not a member of the British fauna during the era of the Breccia, he had become very prevalent during that of the Cave-earth, may probably be taken as indicating that after, but not during, the period of the Breccia, Britain was a part of Continental Europe, and thus rendered his arrival possible. If this be admitted, it follows that the early men of Devonshire saw this country pass from an insular to a continental state, and again become an island." Details of implements, bones, &c. found during the year are given. W. T.

——. Notes on Recent Notices of the Geology and Palæontology of Devonshire. Part 1. Trans. Devon. Assoc. vol. vi. part 2, pp. 646–685.

Several errors having been observed by Mr. Pengelly in various recent works relating to Devonshire, he has brought together, with a view to their correction, a series of notes on the following subjects:—

1. The observations of the Rev. W. S. Symonds in his 'Records of the Rocks,' on the Devonian rocks of Mudstone and Slapton, South Devon.

2. References made in papers by Messrs. Etheridge, Jukes, and Holl, on fossil fish in Devonian rocks.

3. Mr. Etheridge's table of Devonian Trilobites, in Sir Charles Lyell's 'Students' Elements of Geology.'

4. Mr. Maw's paper on the source of the materials composing the White Clays of the Lower Tertiaries (Bovey Heathfield).

5. Notice by the Rev. W. S. Symonds of the granite boulder of Saunton, Barnstaple Bay, in 'Records of the Rocks.'

6. Professor Ramsay, Mr. Dawkins, and Mr. Busk on the Mammalian remains from Brixham Cavern.

7. Various references to Kent's Cavern, by Messrs. Dawkins, A. R. Wallace, T. K. Callard, and Rev. A. G. L'Estrange.

8. Notice of the Mammoth-tooth from the Submerged Forest of Torbay, in 'Records of the Rocks.' T. M. H.

Pengelly, W. The Cavern discovered in 1858 in Windmill Hill, Brixham, South Devon. Trans. Devon. Assoc. vol. vi. part 2, pp. 775–856. 5 plates [plans, views, and sections].

The exploration of Windmill-Hill Cavern was begun in 1859; but, owing to the illness and death of Dr. Falconer, the report on the workings, which had been prepared by Mr. Pengelly, was delayed until 1872. This report consisted of three parts—the first being historical, topographical, and geological, the second descriptive of the results of the exploration, and the third theoretical.

The essential portions of the first part, and, with slight modifications, the whole of the second, have been incorporated by Mr. Prestwich in a general report, read before the Royal Society (printed in Phil. Trans. vol. clxiii. pt. ii.), whilst the third part was not adopted, though the views contained in it were discussed with others. The original report is now published in full, and contains:—inferences as to the origin of the cavern; the relative chronology of the periods represented by the several deposits; the character of the action of the water, with the mode of its ingress and egress; the relative level of land and sea during the Cavern era; conclusions as to the antiquity of the cave-men, and proofs of their being contemporary with the mammoth, reindeer, and rhinoceros. T. M. H.

Pennington, R. On the Ossiferous Deposit at Windy Knoll, near Castleton. Trans. Lit. & Phil. Soc. Manchester, vol. xiv. pp. 1–5.

Bones and teeth of bison, reindeer, bears, and wolves occurred in great abundance in a basin behind a fissure leading from a limestone-quarry, between two ranges, Millstone Grit and Yoredale Hills. The drainage flows into swallow-holes, and ultimately into the Trent. Mr. Dawkins stated that the hare, rabbit, and water-rat were also present. C. E. De R.

——. On some teeth (*Bos priscus*), from a fissure in Waterhouses Quarry, Staffordshire. Trans. Lit. & Phil. Soc. Manchester, vol. xiv. p. 5.

Peyton, J. E. H. The Sub-Wealden Boring at Netherfield. (Read before the Hastings and St. Leonards Hist. & Phil. Soc.) Reprinted from a local paper.

This paper, which is supplementary to one read by the author in 1872, gives an account of the boring to the depth of 620 feet. The lithological and palæontological character of the beds are noted, and the methods of boring are described. The author discusses the probable range of the coal-bearing rocks between Belgium and the west of England. W. T.

Plant, John. On bones of *Elephas primigenius* from a Cavern near Skipton. Trans. Geol. Soc. Manchester, vol. xiii. part iii. p. 54.

The cavern has been rendered inaccessible for the present by the workings of the limestone-quarries midway between Foulridge and Kildwick Stations. C. E. De R.

——. On the occurrence of Quartzite Boulders and Pebbles embedded in true coal. Trans. Geol. Soc. Manchester, vol. xiii. part v. p. 141.

A number of boulders were discovered in the Roger Mine at Dukinfield, at a depth of 400 yards, others at Pendlebury, and a group of twelve in the Two-foot Trencherbone Mine, Spindle Point, Kersley. They vary from the size of a marble to 3 feet in circumference; the corners are smoothed, but the form is sometimes irregular; they correspond to some metamorphic quartzites in the Cambrian rocks of North Wales. Mr. Plant believes them to have been brought into the coal by the denudation of Middle Palæozoic glacial beds, filled with fragments derived from North Wales. C. E. De R.

Playne, G. F. On the Recent Calcareous Deposits of the Cotteswolds. Proc. Cotteswold Nat. Club, vol. vi. pp. 81–89.

The writer refers to the deposits of calc-tufa connected with many of the streams from the Cotteswolds. The deposits at Chalford and Dursley are mentioned particularly, as they have been used for building, as well as for purely ornamental purposes. Mr. Playne points out the method of formation of such deposits, observing that the moss *Hypnum commutatum* and other species of mosses and liverworts aid in arresting the particles of lime as the water passes over them.

Deposits of tufa take place when streams issuing from limestone strata obtain "falls." Mr. Playne suggests the possibility of calc-tufa being profitably produced by artificial appliances. He refers to some stalagmitic deposits, and concludes by pointing out passages in the former history of the lime which in the Cotteswold Hills has most recently taken the form of tufa. H. B. W.

Price, F. G. H. On the Gault of Folkstone. Quart. Journ. Geol. Soc. vol. xxx. pp. 342–366 (section and plate of fossils).

The author divides the Gault of Folkestone into eleven zones. Each is described in detail, its mineralogical character and fossil contents being given. Some analyses (by Mr. W. H. Hudleston) are added. The thickness of the Gault at Copt Point and the Pelter is 99 feet 4 inches; this includes all the beds from the band of sulphide of iron at the base up to the Upper Greensand. Of the 11 zones, 7 belong to the Upper Gault (80 ft. thick); 3 belong to the Lower Gault (18 ft.

10 in. thick); the two divisions are separated by a band of nodules 4 to 10 in. thick. This passage-bed contains many species belonging both to the Upper and Lower Gault; many Lower-Gault forms here become extinct, and many Upper-Gault forms here first appear. The total number of species tabulated is 240. Of these, 124 become extinct in the junction-bed, and 39 are continued into the Upper Gault. There are 59 Upper-Gault forms, some of which first appear in the junction-bed, whilst in that bed itself there are 18 species which occur nowhere else.

The author describes the following new species:—*Avellana pulchella, Natica obliqua, Nucula De Rancei.* W. T.

Prestwich, [Prof.] J. On the Geological Conditions affecting the Construction of a Tunnel between England and France. Proc. Inst. Civ. Eng. vol. xxxvii. pp. 110–145. (Discussion, pp. 146–170.) Geol. Map and Plate of Sections (plates 8 and 9).

The author reviews the beds forming the coasts of the Strait of Dover and its neighbourhood, from the London Clay to the Palæozoic series. The range, depth, thickness, and water-bearing qualities of each are examined. Special attention is given to the Palæozoic rocks, the author believing that it is through them that a tunnel can best be made. Detailed accounts are given of the various borings in which the Palæozoic rocks have been reached; and the author believes that at Folkestone they will occur at from 300 to 400 feet below the sea-level. He thinks the Chalk unsuited for tunnelling, because of the lateral pressure of inland springs, and the probability of meeting with fissures. The Palæozoic rocks, on the other hand, he believes to be compact and protected by overlying impervious beds. The author concludes by pointing out the light which explorations of the Palæozoic rocks must throw upon the question of the possible occurrence of Coal Measures beneath the south-east of England. W. T.

Reade, T. M. Why are the largest Stones found at the East end of the Chesil Bank? Geol. Mag. dec. 2, vol. i. pp. 286, 287.

The author considers that the insetting tidal current, assisted by the prevailing wind, increases in intensity towards Portland; here also the wind-waves have most power. By the former action the large pebbles are carried along, and by the latter are finally cast up. "The individual stones merely follow the law applying to the whole bank, which increases in height and external area as it approaches Portland." W. T.

——. The drift-beds of the North-west of England. Part I. Shells of the Lancashire and Cheshire Low-level Boulder-clay and Sands. Quart. Journ. Geol. Soc. vol. xxx. pp. 27–41.

A typical section of the Liverpool Drift at the Bootle-Lane Station railway-cutting is described.

Shells were found at Toxteth Park, Kirkdale Upper and Lower Brickfields, Bootle-Lane Station and Outlet Sewer, Garston, river Dee between Dawpool and West Kirby, Birkenhead Tramway, Gas-works, Linacre, and N.E. of Edge-Hill Station, where 37 of the 44 species

recorded from all the localities occur. Most of the shells were more or less fragmentary; but a perfect *Leda pernula* occurred at Edge Hill, and a *Tellina Balthica*, with the colouring-matter retained, at Broad Green. The author believes that tidal currents, acting on the various portions of the sea-bed during the subsidence and re-elevation to the extent of 2000 feet, distributed the Drift deposits with their included shells, and caused the lines of bedding observable. *Astarte borealis* and 11 other northern shells occur, as well as 21 that range as far south as the Lusitanian and Mediterranean provinces. Before the low-level marine beds were deposited an ice-sheet passed over the country.
C. E. De R.

Richardson, Ralph. A Tale of Ages, being a poetical description of some of the Geological and Historical Changes which have occurred in the neighbourhood of Edinburgh. 8vo. Edin.

Ricketts, Dr. C. The Metamorphic Rocks of the Malvern Range, and the Strata derived from them. Proc. Liverpool Geol. Soc., Session 15, pp. 72–79.

Refers to evidence of stratification in these rocks, and to the probability of the present contour of the hills being due to successive periods of subaërial denudation. Fragments of rounded quartz, felspar, &c. occur in the conglomerate at the base of the Hollybush Sandstone (Upper Cambrian of Dr. Holl), in the Upper Llandovery (Wenlock Conglomerate of Sedgwick).

Mentions a conglomerate discovered by the sister of the late Professor Phillips on the western side of the Worcestershire Beacon, full of Upper Silurian fossils. States that after the deposition of the Old Red, and probably of the Carboniferous rocks, the strata were contorted, folded, and placed on end, and then denuded, the Haffield conglomerate, porphyry, granite, &c. of Phillips (Permian of the Survey Maps) lying on the upturned edges. C. E. De R.

——. Is the Mersey filling up? Liverpool Daily Courier, May 15th (reprinted).

Discusses the geological history of the Estuary of the Mersey. The rock-basin above Rock Ferry was excavated by glaciers; afterwards the land stood at a higher level than at present, and trees grew which are now submerged; this submergence has formed the estuary. To preserve the water-channels at the entrance it is essential that the water-space, especially in the upper portion, be not lessened, so that the scour may not be lessened—also that the rivers continue to bring down their present quantity of water, and that no obstruction be offered to their flow at ebb-tides. The Lune is instanced as an example where these conditions were not regarded, and where the navigation is consequently impeded. W. T.

Roberts, Capt. John. On the Deposition of Minerals in the Pass of Drws-y-Coed. Rep. Miners' Assoc. Cornwall and Devon for 1873, pp. 41–43.

The copper-ore in the lodes occurs in connexion with slides, which seem to have exercised considerable influence on the deposition of the mineral. C. L. N. F.

Robertson, D., and Crosskey, Rev. H. W. On the Post-Tertiary Fossiliferous Beds of Scotland. Trans. Geol. Soc. Glasgow, vol. iv. part iii. pp. 241–256. 1 plate (plan), 2 woodcuts.

This is the continuation of a paper ending at p. 137 of the same volume. The localities described, whence fossils have also been collected, are the Jordanhill Brick-works, Stobcross, Fairfield near Govan, Paisley Canal, and Dipple Tile-works. Full lists of fossils are given (no new species), and also details of borings through the Drift. G. A. L.

Rudler, F. W. The Geology of Belfast. Academy, no. 119, pp. 184–186.

A sketch of the geology of parts of counties Antrim and Down.

Russell, R. Geology of the Country round Bradford, Yorkshire. Rep. Brit. Assoc. for 1873, Sections, pp. 83–91; and Iron, n. s. vol. xi. pp. 458, 491 (1873).

The rocks are as follows:—Middle Coal Measures, 850 feet; Lower Coal Measures, 1226 feet; Upper Grit, or Rough Rock, with flags at base, 180 feet; Shales, 110 feet; Middle Grit, in several beds, 1400 feet. Each division is described, and the various economic products are mentioned. The lie of the rocks and the scenery which they produce are then described; and the paper concludes with an account of the boulder-beds and river-deposits. W. T.

Sanday, G. H. Report on the Prize-Farm Competition of 1874 (with a Geological Map and Notes on the Geology of Bedfordshire, by J. Wyatt). Journ. Roy. Agric. Soc. ser. 2, vol. x. pp. 564–596.

Short notes on the soils and the geological formations underlying them are prefaced to the Reports on the farms.

Sharp, Samuel. Sketch of the Geology of Northamptonshire. Proc. Geol. Assoc. vol. iii. no. 6, pp. 243–252. (See also Report of Excursion into Northamptonshire, Geol. Mag. dec. 2, vol. i. pp. 469–474.)

The divisions of the Lias, in all 850 feet thick, are the oldest beds; and then come the Northampton Sands, 80 feet thick, the lower part of which is now largely worked for iron-ore, and the upper part is of estuarine origin. These sands are succeeded by other members of the Inferior Oolite, known as Collyweston Slate and Lincolnshire Limestone, the latter of which yields some good building-stone. Then come some clayey beds of estuarine origin, classed with the Great Oolite, and succeeded by the limestone of that formation; then a representative of the Bradford Clay, Forest Marble, Cornbrash, and Oxford Clay. The high lands have often a capping of Boulder Clay and Gravel, whilst the valley-gravels (of later date) yield remains of elephant, rhinoceros, hippopotamus, &c., and are sometimes succeeded by a peaty fluviatile deposit with bones of ox, deer, horse, &c. The range of the various beds is noticed, as well as the physical geography of the county; and it is inferred that no Coal Measures occur at a workable depth. W. W.

Shone, W. On the Discovery of Foraminifera &c. in the Boulder-Clay of Cheshire. Quart. Journ. Geol. Soc. vol. xxx. p. 181.

Fifteen species of Ostracoda were found by washing sand occurring in shells of *Turritella*, found in the Upper Boulder Clay of Newton-by-Chester; also *Spirorbis nautiloides*, fragments of spines of *Cidaris* and *Spatangus*, and 34 species of Foraminifera, most of which also occurred in the Lower Boulder Clay of Dawpool. Their facies indicate a shallow sea, into which large quantities of fresh water constantly poured; and the species corresponded to those now living in the tidal reaches of the Dee. C. E. De R.

Spencer, J. The Third Part of the Description of the Millstone Grit Series of the Parish of Halifax, Yorkshire. Trans. Manchester Geol. Soc. vol. xiii. part vii. 1874.

The bed of marine fossil shells met with at one of the puddle-dykes of the Castle-Carr reservoirs, and in the tunnel between Sowerby Bridge and Luddenham Foot, belong to the shales lying on the Third (Millstone) Grit series. He describes the Grits of Luddenden and Calder dales and Rybourne valley: the Flag Rock or second grit, he places with the first series 350 feet in thickness; his second grit also contains flag-rock, and is 550 to 600 feet in thickness; while his third grit is 300 to 450 feet, containing thin coal-seams and the fossiliferous shales; his fourth division is the recognized fourth or Kinder-Scout Grit. In cutting the Wadsworth-Moor tunnel, connecting the reservoir of Widdop with the Castle-Carr conduit, 2550 yards in length, through his second and third grit series (Third Grits?) shales with *Goniatites*, *Orthoceras*, *Modiola*, *Posidonomya*, &c. occurred. Galena, Marcasite, and an angular breccia were found in joints near a fault.

A section (illustrating this paper) of the Halifax Rough Rock and Flag Rock along the eastern edge of the Wheatley valley, is given in vol. xiii. part vi. C. E. De R.

Steavenson, A. L. Ironstone Mining in Cleveland. Journ. Iron and Steel Inst. no. 2, 1874, pp. 329–337 (plate).

Steavenson [A. L.]. [Note on a Bed of Basalt, in Coal Measures at Browney Colliery, near Durham.] Trans. N. Engl. Inst. Eng. vol. xxiii. pp. 160, 161.

The bed was met with at 60 fathoms from the surface in sinking a shaft; it is 19 feet thick, and lies horizontally. "The rocks, as they approached it, were all altered by the heat; and after they had passed through it, the coal at a depth of several fathoms showed traces of heat, although the intervening rocks ceased to show it." This spot is a mile from the whin-dyke. W. T.

Stevens, Dr. On Sarsens, Greywethers, or Druid Stones. 21st Ann. Rep. Brighton Nat. Hist. Soc. pp. 14–22.

The author notes the distribution, origin, and structure of these sandstone-blocks, especially in Wiltshire, and considers their drifting to be coeval with the formation of the Brick-earth on the high Chalk-tracts, which is inferred to have been deposited at the close of the glacial period. The origin of this bed and of the clay-with-flints is treated of. W. W.

STODDART, W. W. Geology of the Bristol Coal-Field.—Part I. Physical Character. Proc. Bristol Nat. Soc. ser. 3, vol. i. pp. 115–126.

The writer points out the general physical features of the country around Bristol, and describes the eruptive rocks of the Tortworth district, Broadfield Down, Weston-super-Mare, and Uphill, giving analyses. H. B. W.

STRANGWAYS, C. F. Memoirs of the Geological Survey of England and Wales. The Geology of the Country North and East of Harrogate. (Quarter Sheet 93, N.W. of the Geological Survey.) Pp. 21, 6 woodcuts (sections). 8vo. London. [Though dated 1873 on the titlepage, this Memoir was in the hands of the printers in 1874, see last page.]

The tract described is the central part of the Vale of York. The general dip is N.E.; but the Palæozoic rocks in the west are thrown into folds striking N.E. and S.W. The formations described are:—*Yoredale Rocks* (shales with limestone and sandstone); *Millstone Grit* (stone and shale), in which coal has been worked; *Permian*, in four somewhat unconformable divisions—the Lower Marl (marly sandstone), Quick Sand, Lower Limestone, about 175 feet thick, and the Upper Limestone; *Trias* (Bunter Sandstone and Keuper Sandstone and Marl); *Lias*. The Post-Pliocene deposits, which "have more influenced the physical structure of the country and the nature of its soil than the rock formations previously described," are then noticed under the following heads:—*Glacial* (Local Drift, Erratic Drift, Middle Sands and Gravel, Moraines, Esker Drift); *Post-Glacial* (Estuarine beds, Warp Clay, Lacustrine Deposits, Alluvium and River Terraces). In conclusion the "Physical Structure" is described at some length. There are short lists of Fossils from the Millstone Grit, from the Magnesian Limestone, and from the Estuarine beds, and details of a bore-hole at Bog Lane, Harrogate. W. W.

TAWNEY, E. B. The Coal Question. Proc. Bristol Nat. Soc. ser. 3, vol. i. part i. pp. 71–84.

A notice of the Coal Commission Report, and of the probable future exhaustion of coal.

TAYLOR, J. E. A Sketch of the Geology of Suffolk. From White's History, &c., of the County. Pp. 13. Large 8vo. Sheffield.

An account of the literature of the subject is first given; and then the geological formations are described, in ascending order, beginning with the Chalk, the places where it crops out being noticed, and also the various depths at which it has been found in wells. The Reading Beds and London Clay follow next, and many sections are named. The "Box Stone Deposit" is then described: it underlies the Crag, and is characterized by containing many large flints, foreign boulders, and brown water-worn sandstone masses, which last often contain casts of shells, that are disclosed by a sharp blow; and it is now concluded that these stones are the remnants of a deposit older than the Coralline Crag, to which they were once thought to belong. The peculiar Suffolk formations, Coralline and Red Crags, with their chief sections, are noticed, and followed by accounts of the Norwich Crag, Chillesford Clay, and Forest-bed, a description of the sandy gravels and clays of the Lower and Upper Glacial Drifts and of the Post-Glacial beds concluding the essay. W. W.

Taylor, J. E. Underground Explorations. Cassell's Mag. part lv. pp. 67–72.

A description of the Sub-Wealden Boring.

——. A Submarine Forest in the Orwell. Science Gossip, no. 120, p. 278 (and Local Papers).

A notice of a bed of peat, with leaves and trunks of trees, teeth of Mammoth, and freshwater shells, found in deepening part of the channel of the estuary of the Orwell, a little below Ipswich. W. W.

Thomas, D. The Avon Valley Mineral District. Discussion. Proc. S. Wales Inst. Eng. vol. viii. no. 5, pp. 197–206.

The author submitted analyses of the coals by Mr. J. Napier; and a discussion ensued on the faults and anticlinal.

Thomson, James. On the Stratified Rocks of Islay. Trans. Geol. Soc. Glasgow, vol. iv. part iii. pp. 313–315. (Abstract only.)

——, and Caunter, Henry. On the Geology of Lewis. Trans. Geol. Soc. Glasgow, vol. iv. part iii. pp. 315, 316. (Abstract only.)

Topley, W. On the Correspondence between some Areas of Apparent Upheaval and the Thickening of Subjacent Beds. Quart. Journ. Geol. Soc. vol. xxx. pp. 186–194 (woodcut).

The Secondary rocks often thin out in particular directions; it was shown that this must have some effect on the dip of the beds which overlie the particular rocks. Where a whole series of rocks thin in one direction, the sum of the thinning of these rocks will often account for the whole of the dip of overlying rocks. These statements were illustrated by examples of rocks which dip towards geological basins. As regards the beds contained within the basins, it was shown that they often thicken with the dip, or towards the centre of the basin. W. T.

——. Geological Report on the Sub-Wealden Exploration. Rep. Brit. Assoc. for 1873, pp. 491–495.

Gives a detailed section from the surface to 294 feet. Notes are given of the classification of the Wealden beds and the new light thrown on this subject by the boring.

——. The Sub-Wealden Exploration. Trans. N. Engl. Inst. Eng. vol. xxiii. (part vi.) pp. 185–188.

A brief account of the boring and of the beds traversed.

Topley, W. The Channel Tunnel. Pop. Sci. Rev. vol. xiii. pp. 394–403, plate cxiv. (Geological Map and Sections).

The author passes in review the known facts regarding the geological structure of the coasts of the Strait of Dover, and the inferences which may thence be drawn as to the structure of the sea-bed. The water-bearing qualities of the strata are described. Prof. Prestwich's proposal to construct a tunnel through the Palæozoic rocks is discussed, as is also a proposal by Mr. H. Willett to tunnel through the Kimeridge Clay, which has been proved to be over 600 feet thick in the Sub-Wealden Boring. The author concludes that the Lower Chalk offers the best chance of constructing a tunnel. W. T.

——. Notes on the Geology of Rothbury [Northumberland]. Chap. x. (pp. 49–56) of 'Guide to Rothbury and Upper Coquetdale.' Alnwick. Small 8vo, ed. 2. The Geology reprinted from ed. 1, 1873.

The rocks of the district belong to the Carboniferous Limestone series and consist mainly of sandstone; but there are many beds of shale, limestone, and workable coal. "Rothbury Grits" is suggested as a fitting name for the thick beds of sandstone so well displayed round the town. The chief fossiliferous localities are noted. The intrusive basalt known as the Whin Sill is described, and also the vertical dykes. The paper concludes with a description of the Drift, the scenery, and the denudation of the district. W. T.

——, and **G. A. Lebour.** On the Whin Sill of Northumberland. Rep. Brit. Assoc. for 1873, Sections, p. 92.

The authors show that the bed or beds of basalt known as the Whin Sill is intrusive. This is proved by the altered nature of the rocks above the whin, especially when they consist of shales, and by the fact that the whin does not lie at one uniform level amongst the sedimentary rocks, but frequently comes up in bosses, cutting through them, and shifting its relative position amongst them to the extent of 1000 feet or more in short distances. A note by Mr. S. Allport, on the microscopic structure of the basalt, is appended. W. T.

Walker, H. The Glacial Drifts of Muswell Hill and Finchley, with Map, Sections, and other Illustrations. Pp. 24. London.

The author describes the various sections of gravel and Boulder Clay at Muswell Hill and Finchley. In accounting for the origin of these beds, he says that at Finchley we see the material of a moraine which has been extended beneath the sea from the land-ice, and distributed, by means other than that of moving water, over the sea-bottom; and he also states that the original moraine-form may still be seen in the deposit. He adopts the theory of Mr. S. V. Wood, jun., as to the direction whence the glacial clay was brought to Finchley, viz. from Lincolnshire, by a glacier probably 1000 feet thick, ploughing out materials from the Trias, Lias, Oolite, Neocomian, and Chalk, and which had its terminal moraine at Finchley, containing relics of most of these beds. F. J. B.

Walker, H. Excursion to Finchley. Proc. Geol. Assoc. vol. iii. no. 5, pp. 214–216.

A short notice of the Glacial Drift.

——. Excursion to Plumstead and Crossness. Ibid. no. 6, pp. 265–269.

Gives a section of the alluvial beds, and notices the forest-bed of the Thames and Mr. S. V. Wood's theory of its formation.

Ward, J. C. The Origin of some Lake Basins of Cumberland. Quart. Journ. Geol. Soc. vol. xxx. pp. 96–102, plates (map and sections).

Details of the soundings of the lakes are given; and when the results are drawn to scale it is seen that the lakes lie in rock-basins of quite insignificant size as compared with the surrounding ground. The valleys of the district are of ancient date, carved out by the weather and running water. The lake-hollows are of recent date; and various arguments are given to prove that they must have been excavated by glaciers. The lakes have been excavated in the comparatively soft Skiddaw Slates; they correspond in direction with that of the ice-markings in the neighbourhood; the deepest parts of the lakes are at the confluence of old ice-streams. W. T.

——. On the Old Glaciers of Cumberland. 21st Ann. Rep. Brighton Nat. Hist. Soc. pp. 37–41.

Describes the sequence of events during the Glacial Period, and the formation of lake-basins by glacial action.

Ward, Dr. O. Report of the Field-Meeting (at Eastbourne). Papers Eastbourne Nat. Hist. Soc. 1873–4, pp. ii, iii.

——. Subsections in the Strata of the Chalk. Ibid. p. 32 (?).

Suggests the subdivision of the Chalk (near Eastbourne) from the fossils found in various beds.

Whitaker, W. On the occurrence of Thanet Beds and of Crag at Sudbury, Suffolk. Quart. Journ. Geol. Soc. vol. xxx. pp. 401–405 (woodcut section).

The chief section described is in a Chalk-pit at Balingdon, which showed (beneath London Clay) 9 feet of Reading Beds and 14 feet of Thanet Sand. The age of the beds is inferred from their similarity to the Thanet Sand of S. Essex.

The Crag is seen in pits close to the town; it resembles the Crag of other places, and is unlike any drift-bed of the district. It contains phosphatic nodules, phosphatized bones, and ironstone-nodules. Fourteen fossil forms have been discovered; but the species of these cannot often be determined. The Crag here seems at a higher level than elsewhere; it belongs to the Red Crag. W. T.

Wilkinson, S. B., and R. J. Cruise. Explanatory Memoir to accompany Sheets 76 & 77 of the Geological Survey of Ireland; with Palæontological Notes by W. H. Baily, and Microscopical Notes by Prof. Edward Hull. Pp. 28. 8vo. Dublin.

These sheets include parts of Roscommon, Mayo, and Sligo (Ballaghadereen, Kilkelly, and Kiltimagh, with the towns French-park and Elphin).

The ground is comparatively low, save in the north of Sheet 76, where a ridge of Igneous and Silurian rocks rises to heights of 618 and 775 feet; the lower grounds (chiefly Carboniferous rocks), at an average height of 300 feet, are covered in places by extensive alluvial flats and bogs. Five rivers drain the district—the Moy, Lung, Suck, Dalgan, and Breedoge. The formations occurring are:—*Aqueous*: Alluvium, Bog, Drift, Lower Carboniferous Limestone, Lower Carboniferous Sandstone, Old Red Sandstone, Upper Silurian (Wenlock Limestone, Wenlock Grits, Shales, Slates, and Flags, Upper Llandovery Beds). *Igneous*: Basalt, Quartziferous Porphyry, Felstone, Melaphyre, Felspathic Ash; these are confined to the north of Sheet 76 and the eastern corner of Sheet 77.

Palæontological Notes.—Mr. Baily gives a list of localities from which fossils have been collected, another of the various fossils so obtained, and details as to the most important species. Among the Silurian (Upper Llandovery) fossils he notices a specimen which, although ill-preserved, appears to be identical with *Obolus Davidsoni*, a species new to Ireland. Several bivalve shells new to Ireland were also collected in the Llandovery Beds.

Microscopical Notes.—Prof. Hull describes some of the igneous rocks from Ugool. *Felstone Porphyry*, from near Tawnyinah woods, has a mottled felsitic base, with crystals of orthoclase, also chlorite (mostly structureless), grains of magnetite, with hornblende and silica, which shows apparent gas-cavities, and supposed mica. *Diabase*, from Tawnyinah woods and S. of Bellahy: the association of minerals is unusual, orthoclase with augite; the rock is therefore not properly either diabase or melaphyre, but appears to come under the head of pyroxenite of Dana. The specimens show a mottled felsitic base, with imbedded crystals of orthoclase, augite (or pyroxene), magnetite, and grains of silica. Chlorite also occurs. *Felstone Porphyry* (Tawnyinah Tower) in a felsitic base has orthoclase, a triclinic felspar, grains of silica, and magnetite. *Basalt* (three miles S. of Bellahy), a compact rock; it consists of small prisms of felspar in an augitic base, with magnetite or probably titano-ferrite, and pseudomorphs after olivine. The unusual occurrence of several crystals of orthoclase is noticed, also peculiar nail-like bodies apparently of the same composition as the ferrite grains.

The remainder of the memoir is occupied with the "Detailed Descriptions" of each Sheet. Red-deer horns were found in marl at Lough Gal. E. T. H.

WILLETT, H. Report on the Sub-Wealden Exploration. Brit Assoc. Rep. for 1873, pp. 490, 491.

Gives details of the boring from the surface to 300 feet. This part of the boring is 9 inches in diameter. A Geological Report, by W. TOPLEY, is appended (see p. 37).

Willett, H. Sixth, Seventh, Eighth, and Ninth Quarterly Reports on the Sub-Wealden Exploration. 8vo. Brighton.

Contain an account of the boring down to 1030 feet. Details of the mode of working by the Diamond Boring Company are given. There are also notes on the bituminous shales in the Kimeridge Clay and of the gypsum in the Purbeck Beds.

The Geological Reports, by W. Topley, appended to the Sixth and Seventh of these respectively, describe the Kimeridge Clay from 376 feet to 656 feet, noting the mineral character of the beds and the fossils obtained from them, and continue the description to 1000 feet. Oxford-Clay fossils were obtained from near the bottom. W. T.

Wilson, J. M. [Letter on] Well-sinking in the Lincolnshire Fen-district. Geol. Mag. dec. 2, vol. i. p. 143.

——. The Rugby Drift. Rep. Rugby School Nat. Hist. Soc. for 1873, pp. 10–13.

The cutting on the London and North-Western Railway between the station and Clifton Road showed Drift over Lias, the former consisting of sand and gravel over stony clay. The author enters into the question of the glacial origin of the beds, and the direction from which the materials must have come, and concludes that all the Drift is the result of one process while the land was sinking, the materials being derived at first from the neighbourhood and then from greater distances. W. W.

Wollaston, G. H. "Dolmens" or "Erratics." Geol. Mag. dec. 2, vol. i. p. 144.

Mentions four large stones of granite near Southampton Common, also two specimens of rolled greenstone, which are said to have been discovered on the spot where the Hartley Museum now stands. W. T.

Woodward, H., and W. Davies. Notes on the Pleistocene Deposits yielding Mammalian Remains in the vicinity of Ilford, Essex. Geol. Mag. dec. 2, vol. i. pp. 390–398. (Woodcut map and three sections by S. V. Wood, jun.)

Describes the great pit in *Cyrena* brick-earth. The brick-earth is nearly 20 feet thick; in one part it rests directly on London Clay; in another place a thin band of shingly gravel intervenes. The surface is 28 feet above Thames high-water mark. The ground forms a low terrace bordering the Roding on one side; and on the other it slopes gradually down to the Thames. But few remains of Carnivora occur. Elephant-remains are abundant; there are portions of more than 100 individuals in the collection of Sir A. Brady, belonging both to *E. antiquus* and *E. primigenius*. There are three species of Rhinoceros, remains of *R. leptorhinus* being the most numerous; only one fragment of Hippopotamus has been found. Remains of Ruminants are abundant, forming one half of the collection. It is very rare to find two or more bones of the same animal together; but none of the bones are waterworn.

The paper contains extracts from a letter by Mr. S. V. Wood, jun., describing the relations of this deposit to that of others in the Thames valley. The Cyrena-beds of Ilford, Grays, Erith, and Crayford he regards as of the same age, all being referable to the time when the drainage of the Thames valley flowed southwards into the Weald. The subsequent upheaval of the Wealden district accounts for the height (80 or 90 feet) at which the Crayford brick-earth lies. W. T.

WOODWARD, H. B. Glaciation of the South-West of England. Geol. Mag. dec. 2, vol. i. pp. 335, 336.

Mentions the discovery of Boulder Clay, overlying Greensand, on the high ground about two miles N.N.E. of Yarcombe, and between Honiton and Chard. He also refers to the deposits of flint and chert on the tops of the Greensand hills, and suggests that these, too, may be due to marine action during the glacial submergence. W. T.

——. Remarks upon the Relations and Grouping of the Permian and Triassic Rocks. Geol. Mag. dec. 2, vol. i. pp. 385–390.

The author refers to the lithological resemblance between the Permian and Triassic rocks, which sometimes makes it difficult to determine to which group certain beds belong. He reviews the evidence upon which an unconformity is inferred between the Carboniferous and the Permian, and also between the Bunter and the Keuper; and he thinks that these unconformities are *local*. Near Nottingham the Lower Bunter is continuous with the Permian, without any traces of unconformity.

The coast-section between Seaton and Exmouth is described; the whole series (including the Budleigh-Salterton Pebble-beds) might perhaps be termed Keuper; but, owing to the great thickness, there is some justification in thinking that the Muschelkalk may be represented as well as the Bunter, and by sediments of a different character. The author suggests that future researches may lead to a resumption of the term "Poikilitic Series," to embrace the beds between the Coal Measures and the Rhætic Beds. W. T.

——. Rhætic Beds near Newark. Geol. Mag. dec. 2, vol. i. p. 480.

Notices the occurrence of Rhætic Beds at Barrow-on-Soar, where there is a hard bed above the unfossiliferous grey marl which rests on black shales. On deepening a Lias quarry near Newark a hard bed was found, not unlike the "Sun-bed" of the West of England. This probably is homotaxeous with the hard bed at Barrow. The thickness of the Rhætic Beds at Newark is estimated at 50 feet. W. T.

——. A Ramble across the Mendip Hills.—No. I. of "Popular Papers on Geology." Geol. Mag. dec. 2, vol. i. pp. 481–492.

The formations along the route and in its neighbourhood are described, also the scenery and general physical features. Between Bath and Chewton Mendip the Liassic and Oolitic rocks are described, and also the Coal Measures of Radstock. On the Mendips there is Carboniferous Limestone and Old Red Sandstone. Between Wells and Yeovil there is Lias; the main mass of the Inferior Oolite is reached at the latter town; but there is an outlier of the same at Glastonbury Tor. There are notes on the old lead- and zinc-mines of the Mendips. W. T.

WOODWARD, H. B. Glaciation in West Somerset. Geol. Mag. dec. 2, vol. i. p. 573.

Notes that the striations of the sandstone from near Portlock are unlike any form save that attributed to glacial action. The rock is Devonian sandstone. W. T.

——. Notes on the Geology of the neighbourhood of Wells, Somerset. Proc. Somerset Archæol. and Nat. Hist. Soc. vol. xix. pp. 50–64.

The leading features connected with the Palæozoic and Secondary rocks in the country around Wells are pointed out. The lead and zinc mines, and the caverns, combes, and alluvial deposits are briefly noticed. In regard to the Cheddar cliffs, the writer advocates the theory of their formation by subaërial agencies. H. B. W.

——. Geology of Clevedon. Science Gossip, no. 115, pp. 164, 165.

Notices that in the Triassic rocks marl, sandstone, and conglomerate occur at all horizons and replace each other, though there is a certain local order. W. W.

——. Geology of Barnet. Science Gossip, no. 116, pp. 187, 188.

A short notice of the beds found in the neighbourhood.

——. The Geology of London. Pop. Sci. Rev. vol. xiii. no. 50, pp. 1–10, plate.

A sketch of the leading features of the geology of London and its neighbourhood, dwelling more particularly on the great physical changes that the area has undergone since Cretaceous times. The paper is illustrated by a map showing the superficial extent of the different deposits (reduced from the Geological Survey Map), also by a section taken through London from Finchley to Blackheath. H. B. W.

WORTH, R. N. Notes on the Limestone of Yealmpton and its Associated Rocks. Trans. Devon. Assoc. vol. vi. part 2, pp. 703–706.

The limestone of Yealmpton is about two miles in length from west to east, and about half a mile in breadth, being the largest isolated patch of this rock occurring between the masses of Plymouth and Torbay. An intrusive trap occupies a considerable area north of the village of Yealmpton, and, by an upheaval of the limestone, has produced a fissure, through which the river Yealm finds its course. With an important exception, the limestone resembles that of Plymouth in its general character; but in the latter magnesia does not occur, whilst at Yealmpton it is present in such quantities as to convert large masses into dolomite. Other minerals found are hematite, ochre, jasper, calcite, and asbestos. T. M. H.

WÜNSCH, E. A. Discovery in Arran. Coll. Guard. vol. xxviii. p. 746.

Announcement made at a meeting of the Glasgow Geological Society of the finding fragments of rocks containing Carboniferous fossils in a bed of conglomerate of glacial aspect, forming part of the large masses of Red Sandstone adjoining the Carboniferous series of Arran. This settled the question of the age of these beds, which had hitherto been doubtful. They are Lower Permian. G. A. L.

Würzburger, P. On the Geology of the North-Lancashire and Cumberland Iron-Ore Districts. Journ. Iron and Steel Institute, no. 2, 1874, pp. 287–296, plate. (Discussion, pp. 297–299.)

1. Geological Formations: these range from Lower Silurian to Permian. 2. Geological Situation and Form of the Hematite Deposits: these deposits occur as veins in Lower Silurian, but are both larger and purer in the Mountain Limestone—as "flat deposits which follow more or less the dip," as veins, and filling irregular hollows. The Mountain-Limestone deposits are in three districts—Furness, Whitehaven, and Millom. 3. Mineral Composition of the Deposits. W. W.

Wynne, A. B. Raised Beaches and Ancient Irish Volcanoes. Geol. Mag. dec. 2, vol. i. p. 384.

Gives reference to descriptions of raised beaches in the S. of Ireland, and mentions that there is Carboniferous volcanic rock at Croghan Hill, near Phillipstown, which Prof. Jukes thought was the funnel of an old volcano. W. T.

Young, J. On the probable Source of certain Boulders in the Till of the Glasgow District. Trans. Geol. Soc. Glasgow, vol. iv. part iii. pp. 259–263.

Calls attention chiefly to such boulders in the Till of the Glasgow district as are of limestone and clay-ironstone, referable, according to the author (from the fossils they contain), to the Campsie district.

G. A. L.

Young, Prof. J. Geology of the Clyde Valley. Pp. 48, 2 plates (map, views, and sections). 8vo. Glasgow.

A lecture giving a general sketch of the geology of the district.

2. *EUROPE.*

Achiardi, A. D'. Sulla Geologia del Bagno d'Aqui o di Casciana nelle colline pisane. [Geology of the Baths of Aqui and Casciana.] Boll. R. Com. geol. Ital. pp. 216–221.

The environs of the baths are composed of travertin, overlying Subapennine clays and sands. The travertin began to be formed after the uplifting of the Pliocene; for its layers cover horizontally the inclined Subapennine beds; and a consequence of this uplifting was the escape of the tufa-depositing waters, of which the bath-springs are the diminished representatives. E. B. T.

——. Sulle calcarie lenticolari e grossolane di Toscana. Boll. R. Com. geol. Ital. 1874, pp. 361–365, woodcut. [Lenticular and coarse limestones of Tuscany.]

Reviews the fossils from the limestone of Palascio, and admits that they show a Pliocene age, very few being extinct species. E. B. T.

Alth, Dr. A. von. Ueber die palæozoischen Gebilde Podoliens und deren Versteinerungen. Erste Abtheilung. [Palæozoic formations of Podolia and their Fossils.] Abhand. k. k. Geol. Reichs. Band vii. Heft i. pp. 77 (5 plates).

These formations occupy an area of about 300 square miles S.W. of the great granitic plateau of Southern Russia. They are exposed in the beds of the middle Dniester and its tributaries, and are almost horizontal. They thin out eastwards, so that the succeeding Cretaceous beds rest upon older and older Palæozoic rocks, and at last upon the granite.

The lowest of the Palæozoic formations is composed of clay-slates and sandstones resembling greywacke, mostly with few fossils. The second group consists of massive, compact, often bituminous limestones, with beds of marl-slate. Fossils are abundant, and of Upper Silurian age (equivalent to the Wenlock of Wales). The third group consists of slaty marls, with courses of limestone with fossils, also Wenlock. Above comes a group of green shales, with thin beds of black or grey crystalline limestone, which contain numerous characteristic Ludlow fossils, including *Scaphaspis* and *Pteraspis*. Finally, the top of the Palæozoic series is formed by a group of dark-red micaceous sandstones and sandy micaceous shales, shown to be Devonian by their fossils. [For the palæontological part see *post.*] H. A. N.

Anon. [B. E. W.]. A short sketch of the Geology of Nassau. Geol. Mag. dec. 2, vol. i. pp. 365, 366.

An abstract of Sandberger's work on Nassau.

——. The production of Coal in Southern Russia. Coll. Guard. vol. xxvii. pp. 524, 757, vol. xxviii. p. 461.

A *résumé* of a report on the bituminous coal-field of Ekaterinoslav.

Its extent is estimated at 30,000 square miles. The seams vary from 2 to 6 feet in thickness. G. A. L.

Anon. Driving of the St. Gothard Tunnel. Coll. Guard. vol. xxviii. pp. 240, 314, 896.

Articles translated from the 'Annales Industrielles.' The rocks driven through at the Göschenen and Airolo ends are described.

——. Discovery of Iron in France. Coll. Guard. vol. xxviii. p. 532.

Note of the discovery of a vein of iron-ore near Mortain, La Manche.

——. Probable extension of French Coal-fields. Coll. Guard. vol. xxviii. p. 667.

Note of the coal-fields noticed in the "Report of the French Parliamentary Commission of Inquiry into the state of the Coal Trade in France." G. A. L.

——. [? P. Le N. Foster, jun.] Coal Mining in Italy.—The mines of Monte Rufoli. Coll. Guard. vol. xxviii. p. 815; and Journ. Soc. Arts, vol. xxii. no. 1147, pp. 1001, 1002.

The coal (Miocene) is in the clay locally known as "Maltajone," which lies immediately above the Eocene *Albarese* limestone and schists. Each of the two seams is a metre thick. A section of the beds is given.

——. Coal in Turkey. Coll. Guard. vol. xxviii. p. 828.

Note on the coal at Heraklea on the Black Sea, where seams from 5 to 12 feet thick are worked.

——. I calcari a Fusuline nelle Alpi. [Fusulina-limestones in the Alps.] Boll. R. Com. geol. Ital. pp. 105–107.

Notice of a paper by Dr. Fuchs in the "Jahrbuch" of the Geological Institute, 1873. *Fusulina* was found at three horizons, two near the top of the Carboniferous, above the zone of *Pecopteris oreopteridis*, and the third in the Permian. E. B. T.

——. Sulla posizione degli strati di Schio. [Position of the Schio beds.] Boll. R. Com. geol. Ital. pp. 166–168.

A review of Prof. Fuchs's paper in the Proc. Geol. Inst. Vienna. The beds belong to the Aquitanian, Oligocene, or L. Miocene; their peculiarity is in the number of *Pectens* and *Echinidæ* which they contain. E. B. T.

——. The Salt Works of Volterra. Journ. Soc. Arts, vol. xxii. no. 1138, p. 887.

The salt is in beds in Tertiary clays.

——. The Coal Mines of Dranista. Journ. Soc. Arts, vol. xxii. no. 1147, p. 1003.

The aggregate thickness of coal is 8 feet, which may extend over 30 square miles. The coal is of Tertiary age.

——. Carte géologique détaillée de la France. Généralités. B. Avertissement. Historique et définition du travail. Mode de publication. [Geological Map of France. Introductory.] 8vo, 16 pp., map [not geological]. Paris.

The introductory part of the text accompanying the sheets of the new French Government Geological Survey.

Anon. Merridew's Guide to Boulogne-sur-Mer and its environs. Ed. 4, 16mo. Lond. and Boulogne. Chap. xv. Geology, pp. 101–105.

Contains a section of the cliffs from C. Grisnez to Alpreck, by E. Rigaux. [Reduced from a section published in 1865.]

Arnaud, —. Profils à travers la craie du Sud-Ouest. [Sections through the Chalk of South-Western France.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 405–408, pl. ix.

Descriptions of sections in the cuttings of the three lines of the Orleans Railway Company, from Paris to Bordeaux, Paris to Agen, and Coutras to Brives. The study of the different beds of the Chalk tends to show that the South-western Chalk Basin of France, connected with the Ligerian Basin during the period of the Lower Chalk, gradually became disconnected during the Middle Chalk period, and during the formation of the Upper Chalk joined itself to the Pyrenean Basin. These three divisions of the Chalk are:—*Lower Chalk*: 1. *Ichthyosarcolite* beds; 2. *Ammonite* and *Ostræa* marls. *Middle Chalk*: 3. Limestone with *Radiolites lumbricalis*; 4. Beds with *Sphærulites radiosus*. *Upper Chalk*: 5. Coniacien and Santonien; 6. Campanien; 7. Dordonien. G. A. L.

Barbot de Marny, N. [Sarmatian beds in Russia.] N. Jahrb. Heft v. p. 524.

Letter calling attention to the equivalents of the Sarmatian beds in Russia, which are not the Caspian formations of Murchison, as might be inferred from a recent work by Brandt. F. W. R.

Barral, —. Sur les exploitations de phosphates fossiles dans les Ardennes, la Meuse et le Pas-de-Calais. [Phosphate workings in the Ardennes, the Meuse, and the Pas-de-Calais.] Bull. Soc. Cent. Agric. France, 3 sér. t. ix. p. 128.

Barrois, Ch. Etude sur les différentes couches de craie traversées par la nouvelle voie de fer, entre Saint-Omer et Boulogne. [Different beds of Chalk cut through by the railway between St. Omer and Boulogne.] Ann. Soc. Géol. Nord, 1870–74, pp. 9 & 12.

The horizons of the Chalk recognized are:—in the White *Micraster* Chalk, the zones of *M. cor-anguinum* and *M. Leskei*, and at the base the various horizons of the Lezennes Chalk except the *Thun*; in the Chalk Marl, the zones of *Terebratulina gracilis* and *Inoceramus labiatus*; in the glauconitic Chalk, the zone of *Am. varians*. At the base of the system, at Lottinghen and Longfosse, the Gault occurs. G. A. L.

——. Coupe des affleurements du gault et du terrain Néocomien du petit Blanc-Nez et de Wissant. [Section of the outcrops of the Gault and Neocomian beds of the little Blanc-Nez and of Wissant.] Ann. Soc. Géol. Nord, 1870–1874, pp. 13, 14.

Between the clay with *Ostræa Leymerii* and a bed of ironsand worked at Wissant several beds of clay and ferruginous sands with fossils are noted, as corresponding with a parallel series on the English side of the Channel. G. A. L.

Barrois, Ch. *Ammonites texanus* et *subtricarinatus* dans la craie de Lezennes. [*Am. texanus* and *Am. subtricarinatus* in the Chalk of Lezennes.] Ann. Soc. Géol. Nord, 1870–74, pp. 54–55.

Both species new to the district.

——. Notice sur la faune marine du terrain houillier du bassin septentrional de la France. [Marine fauna of the Coal Measures of Northern Basin of France.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 223–226, and Ann. Soc. Géol. Nord, 1870–74, pp. 55, 56.

Of 18 species found, 9 have already been quoted as belonging to the Coal Measures, while the other 9 have only been known in Carboniferous Limestone. This favours the correctness of the theory advanced on stratigraphical grounds, that the northern coal-fields of France owed their origin to the oscillations of the sea-coast, while the more inland basins had been formed in bogs and marshes. G. A. L.

——. L'Etage de la *Gaize* dans le Boulonnais. [Horizon of the Gaize in the Boulonnais.] Bull. Soc. Géol. France, 3^e sér. t. ii. pp. 216–229, 1 woodcut (section).

Between Desvres and Samer a section showed 2 beds of clay, each about 18 inches thick, lying upon the Gault, and below the glauconitic Chalk, with *Turrilites* (Cenomanian). Neither bed has yielded any fossils; but the author refers the upper one to the glauconitic sands with *Pecten asper* of the N.E. of the Paris Basin, and the lower to the *Gaize* of the Argonne. G. A. L.

——, and — **Duvillier.** Terrain crétacé du Boulonnais. [Cretaceous beds of the Boulonnais.] Ann. Soc. Géol. Nord, 1870–74, pp. 52–54.

Chiefly consists of an account of a bed of clay referred to the horizon of the *Gaize* of the Argonne [see above]. An analysis of this clay is given. G. A. L.

Baudrimont, A. Etude des différents sols de la Gironde. [Soils of the Gironde.] 8vo. Bordeaux.

——, — **Chevreul**, and **A. Delesse.** Sur les guanos et sur les phosphates du département du Lot. [Guanos and phosphates of the Lot.] Bull. Soc. Cent. Agric. France, 3 sér. t. ix. p. 514.

Bauwens, —. Note sur un dépôt coquillifère trouvé sous la tourbe à Koekelberg. [Shell-deposit under peat at Koekelberg.] Proc. Verb. Soc. Mal. Belg. t. iii. pp. cciii–ccvi.

Gives a list of shells found in a marly clay, with calcareous concretions, beneath about 3 metres of peat, the clay being 30 centim. only in thickness. The shells are all land and freshwater; and among them is *Clausilia plicatula*, which no longer lives in the neighbourhood of

Brussels, and which has only been found in Belgium at Viesalm and Angres. G. A. L.

Bayan, —. Observations sur la coupe des terrains du Bas-Bugey donnée par M. Falsan. [On M. Falsan's section of the rocks of the Bas-Bugey.] Compt. Rend. 2 sess. Assoc. Franç. pp. 373–78.

The conclusions arrived at by a study of M. Falsan's section are discussed. In comparing the Upper Jurassic beds of Bugey with Quenstedt's divisions in Würtemberg, the equivalence is as follows:—

Weisser Jura ε		Bed with coralline facies of Valfin, l'Echaillon, &c.		Lower Kimeridgian.
Weisser Jura δ		Beds of Armaille.		
Weisser Jura γ	Upper		*Am.-tenuilobatus* zone.	
	Middle and Lower.		*Am.-bimammatus* zone.	Corallian.
Weisser Jura β.				

G. A. L.

Berendt, G. Marine Diluvialfauna in Ostpreussen, und zweiter Nachtrag zur Diluvialfauna Westpreussens. [Fauna of the Drift in Prussia.] Zeit. deutsch. geol. Gesell. Bd. xxvi. 517–521 (plate).

In making the Thurn-and-Insterburg Railway, the first fossils from the drift in East Prussia have been found (6 marine and 1 freshwater). Other species are cited from Western Prussia. F. W. R.

——. Anstehender Jura in Vorpommern. Zeit. deutsch. geol. Gesell. Bd. xxvi. pp. 823–826.

Note on the occurrence of a blue clay of Jurassic age in place near Grimmen in Western Pomerania. It contains Ammonites of the group *Falciferi*, to which the name of *Harpoceras* has been given; and it is placed at the junction of the Lias and Brown Jura, being thus on the lowest geological horizon yet observed in Pomerania and the neighbouring countries. Boulders containing similar fossils are found near Hamburg. F. W. R.

Bergstrand, C. E. Om den geologiska bildningen af Œland och dess förhållande till dervarande odlade jordarter. [Geological structure of Œland and its relation to the soil.] Geol. fören. Stockholm Forhandl. bdt. i. pp. 154–162, 1 fig. in text.

The rocks consist (in descending order) of:—1. Silurian light-grey and reddish limestones (divided into upper *Orthoceratite*-beds and lower *Ceratopyge*-limestone); 2. Alum-shales, with bands of concretionary bituminous limestone or stinkstone, and pyritiferous in the lower layers; 3. Clay-slate; and 4. Grits. General dip E., and not great. G. A. L.

Billy, — de. Constitution géologique de la chaîne des Aiguilles-Rouges (vallée de Chamounix). [Geology of the Aiguilles-Rouges chain.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 40–42.

An acknowledgment that the foot of the chain of the Aiguilles-Rouges is in part formed of sedimentary metamorphic rocks, a retractation of a criticism of M. V. Payot's work on the Geology of the neighbourhood of Mont-Blanc. G. A. L.

Bleicher, Dr. —. Matériaux pour servir à l'histoire du terrain crétacé inférieur de l'Hérault. [Lower Cretaceous beds of Hérault.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 21–27.

Gives palæontological details of sections of the Neocomian beds of Hérault. The author regards the *Serpula*-beds of La Valette as the base of the Neocomian series. G. A. L.

——. Recherches sur les terrains tertiaires lacustres du département de l'Hérault. [Tertiary lacustrine beds of Herault.] Ann. Sci. Geol. v. no. 1, pp. 1–24 (2 woodcuts).

The Tertiaries of the environs of Montpellier, &c. consist at the base of Eocene lacustrine and terrestrial beds, with *Bulimus subcylindricus*, *Flabellaria gelyensis*, &c.; closely connected with these follow lignites, with *Melanopsis Mausiana* and *Palæotherium*. Above are found Oligocene lacustrine beds, conglomerates, grits, red and yellow clays, 300–400 metres thick. Next come the blue marine marls of the L. Miocene (Aquitanian), and lastly Pliocene. E. B. T.

Bock, J. v. Die Steinkohlen-, Torf- und Naphta-Gewinnung in Russland in den Jahren 1860–1871. [The Coal, Peat, and Naphtha worked in Russia.] Röttger's Russische Revue, pp. 30–52.

Chiefly statistical.

Boeck, Johann. Die geologischen Verhältnisse des südlichen Theiles des Bakony. [Geological relations of the southern portion of the Bakony.] Mittheil. Jahrb. kön. ung. geol. Anst. Bd. iii. Heft i. Part ii. pp. 180 (6 plates).

The second and concluding part of the geological description of the Bakony, with a supplement on the fossils [see *post*]. The formations treated of are, in ascending order:—*Lias*. *Oolites*: Upper Dogger, reddish-white limestones, with *Posidonomya alpina*; Tithonian beds, red limestones, with *Terebratula diphya*. *Cretaceous*: Lower (Hippurite limestones); Upper (Gosau formation). *Eocene*: Nummulitic limestone; Calcareous marls, with Orbitoides. *Neogene*: Newer Mediterranean deposits; Sarmatian deposits; Congerian deposits, chiefly freshwater, with contemporaneous basalts and tuffs. H. A. N.

Boettger, Dr. O. Ueber die Gliederung der Cyrenenmergelgruppe im Mainzer Becken. [Divisions of the Cyrena-marl group in the Mayence Basin.] Ber. Senkenberg. Gesel. 1873–74.

Bonney, Rev. T. G. Lake and mountain scenery from the Swiss Alps. Fol. Lond.

24 photographs. Text contains some geological information.

——. Geological information in Walton's 'Bernese Oberland.' Fol. Lond.

Brauns, D. N. Jahrb. Heft i. p. 67.

Note on the third and last part of his work on the Jurassic rocks of N.W. Germany. This work, being chiefly palæontological, will be noticed under "Invertebrate Palæontology" (see *post*).

Brögger, W. C., and H. H. Reusch. Riesenkessel bei Christiania. ["Giants' Kettles" near Christiania.] Zeit. deutsch. geol. Gesell. Bd. xxvi. pp. 783–815 (7 plates, and woodcuts).

English version in Quart. Journ. Geol. Soc. vol. xxx. (see *post*).

Caillaux, Alf. Tableau général et description des mines métalliques et des combustibles minéraux de la France. [Metalliferous mines and mineral fuels of France.] Reprinted from Mém. Soc. Ingénieurs civils. Paris, 1875 (really issued in 1874). Pp. i–vii, 1–632.

Introduction: influence of mineral substances on civilization, &c. A. *General considerations*: nature and mode of deposition of ores, relations between the various ores and their encasing rocks; summary of the different theories as to the deposition of ores, from Agricola to Von Cotta; orography and geology of France sketched, and the mineral produce compared with mineral imports. B. *Descriptions of non-ferriferous metal mines* (1. Vosges and Jura; 2. Upper Savoy and Savoy proper; 3. Western mountains of France; 4. Central mountainous district; 5. South-east and South of France). Each vein is described, and analyses of the ores are given. C. *Iron-mines of France*: arranged by departments; analyses and some geological details are given. D. *Fuels*: information as to the resources of the French coal-fields is given. E. *Appendix*, statistics. The work is a full summarized compilation of historical, statistical, geological, and metallurgical facts. G. A. L.

Canstatt, —. Geognostischer Überblick über Elsass-Lothringen. [Geognostic Survey of Alsace-Lorraine.] Petermann's Mittheilungen, Bd. xx. pp. 16, 17.

A sketch of the geology and mineral productions of these provinces.

Capellini, G. Fossili dei dintorni di Porretta. [Fossils from the neighbourhood of Poretta; extracted from the Proceedings of the Bologna Academy of Science.] Boll. R. Com. Geol. Ital. pp. 248, 249.

From fossils found, the correspondence of the Apennine "Macigno" and Carpathian sandstone to the nummulite-rocks of Nice, Egypt, &c. is inferred. E. B. T.

——. La formazione gessosa di Castellina Marittima e suoi fossili. [Chalk formation of Castellina Marittima and its fossils.] 4to. Bologna, 83 pp. (9 plates, map, sections, and fossils).

Chambrun de Rosemont, A. de. Etudes géologiques sur le Var et le Rhône pendant les périodes tertiaires et quaternaires, leurs deltas, la période pluviaire. Le Déluge. [Geological studies on the Var and the Rhône during the Tertiary and Quaternary epochs, their deltas, the rain-period. The Deluge.] 132 pp., 1 map, and 7 plates. 8vo. Nice.

Chambrun de Rosemont, A. de. Sur le Delta du Var et la période glaciaire. [Delta of the Var and the Glacial period.] Compt. Rend. 2 sess. Assoc. Franç. pp. 361, 362 (abstract).

Chantre, Ernest. Note sur un nouveau gisement de la Mollasse marine à Lyon. [Marine Molasse, Lyons.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 206, 207.

This deposit is like the one at the Jardin des Plantes. It is on the other side of the Saône, on the N.W. flank of the hill of Fourvière. This shows the continuity of the Upper Miocene from the south of the Rhône-basin to beyond Lyons. G. A. L.

Chellonеix, E. *Ammonites peramplus* dans la craie d'Annapes. [*Am. peramplus* in the Chalk of Annapes.] Ann. Soc. Géol. Nord, 1870–74, p. 4 (note).

——. Sur le diluvium de Sangatte et les falaises du Blanc-Nez. [Sangatte drift and cliffs of Blanc-Nez.] Ann. Soc. Géol. Nord, 1870–74, pp. 6, 7.

Headings of sections only given.

——. Fossiles de la craie glauconieuse au Blanc-Nez. [Fossils of the glauconitic chalk at Blanc-Nez.] Ann. Soc. Géol. Nord, 1870–74, p. 9.

Note of signs of the *Belemnites-plenus* zone at the base of the Chalk Marl, and of *Nautili* in the *Ammonites-varians* zone in the glauconitic chalk. G. A. L.

——. Tourbe et sable Landénien à Don. [Peat and Landenian sand at Don.] Ann. Soc. Géol. Nord, 1870–74, p. 12.

Note of a new locality for Lower Landenian deposits on the banks of the Deûle.

——. Excursions dans le Pas-de-Calais. Ann. Soc. Géol. Nord, 1870–74, pp. 30, 31, 45–50, 57–64, 67–73.

Report of geological excursions in the neighbourhood of Béthune, Bully-Grenay (with two pit-sections, one through the Chalk to the Gault, the other from the Chalk to Lower Devonian rocks), and Bouvigny; Lillers, Perne, Aumerval, and Saint-Hilaire; Lens and Liévin; Mont St.-Eloi, Arras, and Saint-Pol. Sections, fossil localities, and miscellaneous geological information given. G. A. L.

Chelloneix, E., and — Ortlieb. Landénien fossilifère de Mons-en-Barœul. Ann. Soc. Géol. Nord, 1870–74, p. 6.

Note of occurrence of fossiliferous Landenian.

——, ——. Grès à *Num. lævigata*, dans le diluvium du mont des Chats. Ann. Soc. Géol. Nord, 1870–74, p. 36.

Note of occurrence of *Num.-lævigata* grit in Drift.

Clar, Dr. C. Kurze Uebersicht der geotektonischen Verhältnisse der Grazer Devonformation. [Geotectonic relations of the Devonian formation of Graz.] Verh. k.-k. geol. Reichs. pp. 62–65.

An account of the stratigraphical relations of the Devonian deposits of the vicinity of Gratz. The beds are divided into groups.

Clar, Dr. C. Neue Beobachtungen aus der Gegend von Gleichenberg. [New observations in the neighbourhood of Gleichenberg.] Verh. k.-k. geol. Reichs. p. 91.

Clemens, Prof. Jos. Beiträge zur Kenntniss des älteren Tertiär in Oberen Gran-Thale. [Contributions to a knowledge of the older Tertiaries of the Upper Gran valley.] Verh. k.-k. geol. Reichs. pp. 332–334.

Cleve, P. T. Fynd af ett siluriskt lager i Bohusläns skärgård. [Discovery of Silurian beds in the Bohusläns rock-district.] Geol. fören. Stockholm Förhandl. bd. i. pp. 28, 29.

An announcement of the discovery.

Cogels, P. Note sur un gisement de Térébratules aux environs d'Anvers. [*Terebratula*-bed near Antwerp.] Proc.-Verb. Soc. Mal. Belg. t. iii. pp. xviii–xxi.

Proves that the green sand with *Terebratula grandis* of Dejardin is really in the *Diestian* series. Details of section given, and notes of other fossils found. G. A. L.

——. Seconde note sur le gisement de la *Terebratula grandis* avec quelques observations à ce sujet. [Second note on the *Terebratula-grandis* bed.] Proc.-Verb. Soc. Mal. Belg. t. iii. pp. xxxviii–xlv.

Concludes that *Terebratulæ* have not been found in place above the green *Diestian* sands. The relations of these sands to the *crag gris* and other associated beds are considered, and Dejardin's classification is criticsied. G. A. L.

——. Nouvelle note sur le gisement de la *Terebratula grandis*. [New note on the *T.-grandis* bed.] Proc.-Verb. Soc. Mal. Belg. t. iii. pp. lxix–lxxxvi.

Rejoinder to M. Mourlon's criticisms (see p. 84). The author's final views are as follow:—That the *Terebratula* green sand and a certain coral-bed are both in the series known as the grey sands; that the zone in which the *Terebratulæ* are found entire and in place belong to the *Diestian* system; that above this zone is a line of rolled débris with signs of denudation; that the corals are later than the rolled débris; that currents afterwards caused a mixture of the fossils; and that this *Terebratula* has only hitherto been found at one horizon, which is *Diestian* and *not Scaldisian*. G. A. L.

——. Note sur un gisement d'*Ostrea cochlear* aux environs d'Anvers. [Bed with *O. cochlear* near Antwerp.] Proc.-Verb. Soc. Mal. Belg. t. iii. pp. c–ciii.

Description of a measured section through Tertiary beds near the Porte Léopold.

Coquand, H. De l'âge et de la position des marbres blancs statuaires des Pyrénées et des Alpes apuennes en Toscane. [Age and position of the statuary-marbles of the Pyrenees and of the Apuan Alps, Tuscany.] Compt. Rend. t. lxxix. p. 411.

Considers the saccharoid marble of St. Béat to be of Carboniferous age, and contemporaneous with that of Carara. The stratified series in the Apuan Alps is as follows :—*Lias*, *Rhætic*, *Permian*, *Carboniferous*, formed at its base of the Carrara marbles and above of shale, with Coal-Measure plants and *crystalline schists* of Serravezza. G. A. L.

Coquand, H. Sur l'âge des sels gemmes de la Moldavie. [Age of the rock-salt of Moldavia.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 365–371.

Considers these deposits of salt to be Oligocene rather than Miocene.

Cornet, F. L., and A. Briart. Notice sur les gisements de phosphate de chaux dans le terrain crétacé de la province de Hainaut. [Phosphatic deposits in the Cretaceous beds of Hainault.] Bull. Ac. roy. Belg. 2 sér. t. xxxvii. pp. 838–841.

These phosphates occur in nodules in the *Poudingue de Malogne*, the base of the *tufeau de Ciply* (=Maestricht beds of Limbourg), which lies unconformably upon the Lower Cretaceous rocks. This nodular band is rarely thick enough for working. The *craie brune de Ciply*, which lies below the Malogne conglomerate, is also phosphatic, and might, according to the writers, be profitably worked. G. A. L.

——, ——. Lecture d'ouverture à la réunion extraordinaire de la Société Géologique de France à Mons. [Address at the Mons meeting of the Geological Society of France.] Mons. 29 pp.

A general description of the geology of the district round Mons. The Tertiary and Cretaceous deposits are described in some detail, their subdivisions given, with lists of fossils from the *Paniselian* and *Upper Ypresian* (by M. Nyst). G. A. L.

——, ——. Note sur la découverte de l'étage du calcaire de Couvin ou des schistes et calcaire à *Calceola sandalina* dans la vallée de l'Hogneau. [Discovery of the Couvin limestone in the Hogneau valley.] Ann. Soc. Géol. Belg. t. i. Mém. pp. 8–15, pl. i. (map).

Detailed account of the rocks in this valley, comprising six horizons distinguished in the map, Nos. 5 and 6 being a blue limestone representing the Couvin bed, and a limestone with *Stringocephalus Burtini*, referred to the Givet limestone (Devonian). G. A. L.

Cornuel, —. Note sur la valeur d'une description qui a indiqué, il y a cent-onze ans, des fossiles d'eau douce dans le fer oolitique du village de Narcy. [Old description of freshwater fossils.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 340–346.

A vindication of Grignon, who, in 1761, called attention to the *freshwater* fossils in the oolitic iron of the Upper Neocomian of the Paris Basin. G. A. L.

Credner, Hermann. Eine Excursion der deutschen geologischen

Gesellschaft durch das Sächsische Gebirge. Zeit. gesam. Nat., n. F. Bd. x. pp. 212–222.

Account of a four-days' excursion through the Saxon mountains by the German Geological Society, in Sep. 1873.

Danzig, E. Ueber das Quadergebirge südlich von Zittau. [Quader rocks south of Zittau.] Isis, Dresden (Sitzungsb.).

Dathe, E. [Silurian boulders from Leipzig.] N. Jahrb. Heft iv. pp. 412, 413.

Letter on the discovery of boulders containing Silurian fossils at the Zeitzer Thor, Leipzig.

Dawkins, Prof. W. B. Cave Hunting. (See p. 9.)

Debray, H. Tourbières du Littoral flamand et du département de la Somme. [Peat of the Flemish coast and of the Somme.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 46–50.

An account of discoveries of bones and Roman coins in the peat-beds of the north-east of France, the latter proving that the overlying deposits (sometimes of considerable thickness) are newer than the Roman occupation of the districts. G. A. L.

——. Tourbières entre Albert et Aveluy. [Peat between Albert and Aveluy.] Ann. Soc. Géol. Nord, 1870–74, pp. 8, 9.

Abstract only. The chief facts are the alternation of peats of various quality with sandy chalk or peaty calcareous beds; the erosion of the peat-surfaces and subsequent filling up with reassorted chalk; and the existence of faults affecting part of these deposits. G. A. L.

——. Tourbières d'Ardres, Guemps, Nortkerques et Looberghe. [Peat of Ardres, &c.] Ann. Soc. Géol. Nord, 1870–74, pp. 19–22.

Concludes that the upper marine deposits above the peat are very recent, and later than the Roman conquest, that at the time of the Roman invasion this region consisted of peaty marshes, and that the formation of all the deposits of peat is earlier than the Roman conquest. G. A. L.

——. Forages à La Gorgue, à Elbringhem et à Estaires. [Borings at La Gorgue &c.] Ann. Soc. Géol. Nord, 1870–74, p. 33.

Details of section at the first place are given, but only the depth to marl at the others.

——. Altitudes de plusieurs couches de tourbe des environs de Dunkerque et limites de leur prolongement vers la mer. [Heights of peat-beds around Dunkirk and limits of their seaward extension.] Ann. Soc. Géol. Nord, 1870–74, pp. 84, 85.

The highest littoral bed of peat (at Sangatte) is 2·40 metres above sea-level, the lowest (at Dunkirk) 6·40 below sea-level.

Delaire, A. [The Hydrology of the basin of the Seine.] Annales du Conservatoire des Arts et Métiers, no. 138, pp. 335–392.

The Seine basin has an area of 30,501 square miles, impermeable soils occupying 7722 square miles. "The sources and the nature of the rivers vary according to the geological character of the district: thus, when the soil is impermeable (as, for instance, the granite of Morvan, the lias of Auxois, and the clay of Champagne), the streams are numerous but small, and, as the water runs quickly off the surface, the streams and rivers swell rapidly in time of rain, forming torrents, the beds of which are generally dry in summer; in permeable soil, such as the oolitic limestone of Burgundy, the white chalk of Normandy, and the sands of Fontainebleau, the streams rise in the marshy meadows of deep valleys, the springs are considerable and are frequently found at the junction of permeable with impermeable strata, the rivers are few, not generally liable to dry up, and their course is gentle. The hardest water comes from the limestones, Lias, and gypsiferous strata. The water-supply of Paris is obtained from the Dhuis and the Vanne." (Proc. Inst. Civ. Eng. vol. xxxix. p. 365.)

Delitsch, O. Aus den französischen Gebirgen. I. Eine Wanderung im Cantal. [A journey in Cantal.] Aus allen Welttheilen, pp. 236–238, 268–270.

Deshayes, V. Sur le gisement de Cuivre du Charrier près la Prugne (Allier). [Copper-deposits near La Prugne.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 504–514, pl. xi.

The ore is Phillipsite in a vein very similar in its associated rocks to those of Monte Catini. The rock of the country is granitoid porphyry, and the vein-stuff is chiefly serpentinous. The direction of the lode is generally N. and S. The average ore yields from 8 to 20 per cent. of copper. G. A. L.

Désor, E. Die Moränen-Landschaft. [Moraine-scenery.] Verh. Schweiz. naturf. Gesell., 1 map.

The map is of the district of Amsolderungen near Thun, on a scale of 1 : 25,000.

Dewalque, G. Sur l'extension verticale de quelques fossiles dévoniens réputés caractéristiques. [Vertical range of some reputed Devonian fossils.] Ann. Soc. Géol. Belg. t. i., Bull. pp. lxii, lxiii.

Spirifer distinctus, Sow. (*S. Verneuili*, Murch.) supposed to be characteristic of the Upper Devonian, has been found near the base of the *Eifelian* or Middle Devonian.

Receptaculites Neptuni, Defr., has a like range. *Stringocephalus Burtini*, Defr., considered to be characteristic of the Givet Limestone, ranges below to the Couvin schists and limestones. *Pleurodyctium problematicum*, Defr., ranges from the *Coblencian* series, of which it has been looked upon as characteristic, probably to the *Calceola* schists.

G. A. L.

——. Sur le parallélisme des terrains ardennais et cambrien. [Parallelism of the Ardennais and Cambrian series.] Ann. Soc. Géol. Belg. t. i., Bull. pp. lxiii, lxiv.

The Harlech grits and Llanberis slates are referred to the *Devillian* system, the Lingula-flags to the *Revinian*, and the Tremadoc slates to the *Salmian*. G. A. L.

Dewalque, G. Sur la coupe tertiaire des environs de Bruxelles décrite par M. Rutot. [Tertiary section near Brussels.] Ann. Géol. Belg. t. i. Bull. pp. lxvi–lxviii.

The writer is of opinion that the *Laeckenian* figured in M. Rutot's section is really *Bruxellian* coloured and altered by infiltrations.

——. Sur l'allure des couches du terrain cambrien de l'Ardenne, et en particulier sur la disposition du massif Devillien de Grand-Halleux et sur celle de l'hyalophyre de Mairu, près Deville (dép. des Ardennes). [Lie of the Cambrian of Ardenne, and arrangement of the *Devillian* series of Grand-Halleux, and on that of the Hyalophyre of Mairu, near Deville.] Ann. Soc. Géol. Belg. t. i. pp. 65–70.

Discusses the views of others on this subject, but thinks there is no reason to alter Dumont's classification of the *Revinian* and *Devillian* series in this district. The Mairu porphyry is regarded as non-intrusive. G. A. L.

Doelter, Dr. C. Aus dem siebenbürgischen Erzgebirge. [On the Transylvanian Erzgebirg.] Jahrb. k.-k. geol. Reichs. Bd. xxiv. Heft i. pp. 7–32 (geological sketch map and a woodcut).

The crystalline rocks are mostly mica-schists with garnets, occasionally approaching to gneiss; connected with these are crystalline limestones; there is no proof that the latter are metamorphosed sedimentary beds. The older eruptive rocks are Granites, Diorites, and Syenites. Of Secondary rocks, limestones without fossils, but supposed to be of Tithonic age, occur; eruptive rocks connected therewith are augite-porphyries and melaphyres. More than one subdivision of the Miocene is seen, and a certain amount of lignite is found; the eruptive rocks connected with the Tertiaries are important, viz. hornblendic andesites with and without quartz, augitic andesite, and basalt. The andesites are mostly of Aquitanian age, being certainly older than the Congeria-beds; in the Nagyag district they all contain metallic veins. The results of a microscopic examination of many of these rocks are given. E. B. T.

——. Porphyritvorkommen bei Lienz. [Occurrence of porphyry at Lienz.]. Verh. k.-k. geol. Reichs. pp. 146, 147.

——. Das Obere Fleimser-Thal. [The Upper Fleimser valley.] Verh. k.-k. geol. Reichs. pp. 322–324.

Observations on the ages of the various eruptive rocks of the Fleimser valley.

——. Das Monzoni-Gebirge. [The Monzoni Mountains.] Verh. k.-k. geol. Reichs. pp. 380, 381.

Describes the eruptive rocks of the Monzoni Mountains.

Dollfuss, G. Sédiments et faune du *Sinus Itius.* [Sedimentary deposits and fauna of the *Sinus Itius.*] Ann. Soc. Géol. Nord, 1870–74, pp. 10, 11.

Abstract. Lists of mollusca from three sets of deposits, representing the bed of the Roman *Sinus Itius* between St. Omer and the sea, are given. These marine beds lie between the old peat and the soil. G. A. L.

——. Fossiles dans l'Yprésien de Roubaix. [Fossils in the Ypresian of Roubaix.] Ann. Soc. Géol. du Nord, 1870–74, pp. 12, 13.

Section shown by works at the railway-station, with names of fossils found.

——. Fossiles dans l'Yprésien de Mouscron. [Fossils in the Ypresian of Mouscron.] Ann. Soc. Géol. Nord, 1870–74, pp. 44, 45.

Section at the Mouscron station, with names of fossils found.

——. Sur un travail de M. Vieillard, Ingénieur des Mines, intitulé: Le terrain houiller de Basse-Normandie. [On a work entitled "the Coal Measures of Lower Normandy."] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 308–312.

Defines the boundaries of the coal-fields in question. The author thinks it improbable that other coal-fields may be found in Normandy in other Silurian folds. G. A. L.

Drasche, Dr. [R.] von. Ueber ein merkwürdiges Gang-Vorkommen bey Throndhjem in Nowegen. [On the occurrence of a remarkable vein at Throndhjem in Norway.] Verh. k.-k. geol. Reichs. pp. 40, 41.

Describes the occurrence of a remarkable vein of protogine.

Drouaux, G. Rapport sur les Travaux de la Société pendant l'Année 1873. [Work of the Society in 1873.] Bull. Soc. Géol. Norm. t. i. 2 fascic. pp. 193–216.

Dumortier, —. Etudes Paléontologiques sur les dépôts Jurassiques du Bassin du Rhône. [Palæontological studies on the Jurassic deposits of the Rhône basin.] Compt. Rend. 2 sess. Assoc. Franç. p. 364 (abstract).

Upper Lias divided into two zones characterized by *Ammonites bifrons* and *A. opalinus.*

Dupont, —. Note sur le terrain dévonien. [On the Devonian.] Bull. Ac. roy. Belg. 2 sér. t. xxxvii. pp. 196–198.

Observations on Prof. Gosselet's paper on the Devonian rocks of the country between the Sambre and the Meuse.

Ebray, Th. Parachèvement de la démonstration de l'existence du Lias inférieur, à Charlieu. [Lower Lias at Charlieu.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 208, 209.

A note establishing the existence of the Lower Lias on the evidence of a few fossils.

Ebray, Th. Un avertissement au sujet du Tunnel de la Manche. [A warning with regard to the Channel Tunnel.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 209, 210.

Believes in the impracticabilityof the Channel Tunnel, owing to the inlets of water, which will, at some point of the work, stop further progress. G. A. L.

——. Raccordement des calcaires kimméridgiens de Cirin avec ceux de Chambéry. [Correlation of the Kimeridge Limestones of Cirin and Chambéry.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 259-261, 1 fig. in text.

The beds underlying the "Valanginian" series at places only 4 kilometres distant are thus given :—

Mont Lépine.	Lémine and Montagnolle.
1. Valanginian.	1. Valanginian.
2. Purbeck beds.	2. Cement marls.
3. Portlandian with fossils.	3. Limestones with *Ammonites subfimbriatus*.
4. Kimeridgian with *Zamia*.	4. Limestones with same fauna as at Berrias.
5 & 6. Upper Coralline (Coral Rag).	5. Coral-Rag corals.
	6. Beds with *Am. iphicerus*.

G. A. L.

Erdmann, Edward. Description de la formation carbonifère de la Scanie. [Coal-bearing formation of Scania.] French translation of his work of 1873.

——. En rullstensås i Stoby socken, Skåne. [Pebble-ridge in Stoby, Scania.] Geol. fören. Stockholm Förhandl. bd. i. pp. 123-125, plate x.

The description of a narrow ridge. The plate gives a map and cross-section of the ridge and surrounding gravelly and sandy beds and peat. The explanation of the ridge is problematical. G. A. L.

——. Bidrag till frågan on Skånes nivåförändringar. [Rise of land in Scania.] Geol. fören. Stockholm Förhandl. bd. i. pp. 93-104, plates vi., vii.

It has been thought that Scania is sinking, whilst the northern part of the Scandinavian peninsula is rising. It is undeniable that in Scania depression has taken place, even within the historical period; but the author proves that this continues no longer, having been succeeded by a state of rest or even of slight rise. E. E.

——. Om den geologiska beskaffenten af trakterna kring Tågarp Eslöf och Ystad. [Geology of the regions about Tågarp, &c.] Geol. fören. Stockholm Förhandl. bd. i. pp. 139-147, pl. xiii.

Two small geological sketch maps are given, showing the positions of faults, borings, and sections. The formations are :—the Coal-bearing rocks of Scania, Red clays and sandstones, and Silurian rocks. Many of the bore-holes are in the last two. G. A. L.

Erdmann, E. Fosforsyrehaltigt konglomerat. [Conglomerate with phosphoric acid.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 205, 206.

Note of conglomerate, about 2¼ Swedish miles north of Ystad, which has been shown by analysis to contain 1·5 per cent. of phosphoric acid. The nearest rocks are Silurian schists. G. A. L.

——. Iakttagelser öfver moränbildningar och deraf betäckta skiktade jordlager i Skåne. [Moraine-beds of Scania and the stratified clays and sands they cover.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 210–232, plates xix.–xxiv.

Descriptions and figures of drift-sections in Scania, showing how the stratified clays and sands have been raised, curved, contorted, and partly obliterated by "inland ice" and glaciers, and how they are in many places covered by immense masses of moraine-matter, till, or boulder-clay. G. A. L.

——. Bidrag till kännedomen om de lösa jordaflagringarne i Skåne. I. [Quaternary beds of Scania.] Geol. fören. Stockholm Fördhandl. bdt. ii. pp. 13–23, 101–106, pls. i., ii., iv.

Shows how the interglacial sands and clays appear in the Boulder Clay, and gives sections of them. Sometimes several interglacial beds occur above one another, indicating several periods of milder climate. These were succeeded by a renewed extension of the inland ice, when thick beds of moraine-matter were laid down upon them. In one of these interglacial layers, covered by nearly 70 feet of Boulder Clay, the author found freshwater shells. Detailed sections at this place and at other places, and a number of vertical drift-sections, taken from borings and sinkings for coal, are given. G. A. L.

——. Nya fyndorter för s. k. strutmergel i Skåne. [New localities for the so-called "funnel-marl" in Scania.] Geol. fören. Stockholm Förhandl. bdt. ii. p. 49.

——. Om stenkolslagren i Skåne. [Coal-series of Scania.] "Ur vår tids forskning." Part i. ed. 2. 8vo. Stockholm. Pp. 61–90, 4 figs. in text, and a coloured geological map of Scania.

This Liassic coal-field extends over many hundred Swedish square miles (1 square mile Swedish = about 36 English). The coal-bearing beds lie upon red sandstones and clays, probably Triassic. The coals are little worked, but are capable of being extensively wrought. The seams vary in number and in thickness, the best being in the lower parts of the formation. The coal contains little or no sulphur, and is a good house- and gas-coal. Beds of good fire-clay usually accompany the coals. In the geological map the formations distinguished are:—Primitive (gneiss &c.), Cambrian, Silurian, Red sandstones and clays (Keuper?), Hör sandstone, Lias and Rhætic, Cretaceous. Diabase and Basalt are the igneous rocks shown. The chief faults are mapped and also the positions of the coal-pits. Most of the boundary-lines are faults. G. A. L.

Ertborn, [Baron] O. van. Sur le terrain tertiaire d'Audenarde [Tertiaries of Audenarde.] Ann. Soc. Géol. Belg. t. i. Bull. pp. xlvii, xlviii.

Section of a boring at Audenarde station; depth 63½ metres. Horizons represented, Upper and Lower Ypresian and Upper Landenian.

——. Note sur les sondages de la province d'Anvers. [Borings in the province of Antwerp.] Ann. Soc. Géol. Belg. t. i. Mém. pp. 32–44.

Accounts of 9 borings through the following Tertiary formations—*Campinian*, *Diestian*, Upper and Lower *Rupelian*, *Tongrian*, Upper and Lower *Laeckenian*, Upper and Lower *Ypresian*. G. A. L.

Escher von der Linth, A. Beiträge zur geologische Karte der Schweiz. 13^{e} Lief. Die Sentis-Gruppe. [Contributions to the Geological Map of Switzerland. The Sentis Group.] 2 maps, 2 plates of sections. Berne.

Fabre, G. Note sur les sables granitiques éruptifs dans les environs de Paris. [Granitic sands near Paris.] Bull. Soc. Géol. France, 3 sér. t. i. p. 389.

A note of a new locality, at the edge of the plateau of Plessis-Picquet, for sands composed of eruptive granite in the line of a system of faults and fractures, along which, near Vernon, similar deposits were found last year. G. A. L.

——. Note rectifying statements made in a communication to the Society on Nov. 4, 1872. Bull. Soc. Géol. France, 3 sér. t. ii. pp. 197, 198.

——. Sur les schistes à posidonies de la Lozère. [*Posidonomya* shales of the Lozère.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 198, 199.

These shales divide the Lower Lias marls with *Ammonites margaritatus*, or Middle Lias, from the Upper Lias marls with *Am. radians*. They are constant in the minutest details over more than 60 miles, one shaly band, less than a centimetre in thickness, covered with *Posidonomya Bronnii*, being everywhere noticeable. The author finds the following zones constant (in descending order):—Shale with *Bel. tripartitus* and *Inoceramus*. Shale with Limestone and *Am. serpentinus* and *Bel. gracilis*. Limestone with fish. Band with *Posidonomya Bronnii*. Passage-bed with *Monotis substriata*. G. A. L.

Falsan, —. Coupe des terrains du Bas-Bugey. [Section at Bas-Bugey.] Compt. Rend. 2 sess. Assoc. Franç. pp. 371, 372.

Description of a section exhibited, showing chiefly Upper Jurassic beds and their relations with the Lower Cretaceous rocks.

——. Sur une carte du terrain erratique et des anciens glaciers de la partie moyenne du bassin du Rhône dressée par MM. Chantre et Falsan. [On a map of the Drift and Old Glaciers of the Basin of the Rhone.] Compt. Rend. 2 sess. Assoc. Franç. pp. 386–402.

A detailed description of the glacial deposits, and of phenomena ascribed to glaciers alone by the author. The map is a MS. one, comprising 6 sheets of the French "Carte de l'Etat-Major." G. A. L.

Favre, Ernest. Revue géologique Suisse pour l'année 1873. [Swiss Geology for 1873.] Arch. Sci. Bib. Univ. Genève, t. l. pp. 269–304, 329–354. Also separate reprint, pp. 66, with index of authors and table of contents. 1 plate.

Gives abstracts of all works on the geology of Switzerland published in 1873, under 3 heads:—Descriptive geology; the study of the various formations in chronological order; and Petrology, Applied Geology, &c. The papers of 83 authors are analyzed, and 7 sections are given illustrative of some of the points touched on. The chief subjects discussed are:—the general geology of the Western and Eastern Alps, the plain of Switzerland, the Jura, and the Rhine valley; the crystalline and Palæozoic rocks; Triassic, Jurassic, Cretaceous, Tertiary, and Quaternary beds. G. A. L.

Feistmantel, Ottokar. Einige Worte zur Erklärung über die Schichten des Rothliegenden bei Budweis. [Lower Permian shales of Budweis.] Verh.k.-k. geol. Reichs. pp. 34–36.

A defence of the author's views as to the stratigraphical relations of the above-mentioned deposits.

——. [Carboniferous rocks of Bohemia.] N. Jahrb. Heft iv. pp. 406–410.

Letter giving an account of researches on the Carboniferous rocks of Bohemia, and their flora.

Firket, Ad. Sur l'existence du schiste gris fossilifère au nord du massif de Condroz. [Presence of the grey fossiliferous schist N. of the main mass of Condroz.] Ann. Soc. Géol. Belg. t. i. Bull. pp. xxxvii, xxxviii.

Note of occurrence at La Houzée, &c. of supposed *Calceola* schists lying between the Burnot conglomerate and the Givet limestone.

——. Transformation sur place du schiste houiller en argile plastique. [Transformation in place of Coal-Measure shale into plastic clay.] Ann. Soc. Géol. Belg. t. i. Mém. pp. 60–64.

Note of a case in which this alteration has been produced by means, it is supposed, of the action of percolating rain-water, within 700 years. G. A. L.

Foster, P. Le N., Jun. Coal-mining in Italy. Journ. Soc. Arts, vol. xxii. no. 1139, pp. 900–902 (Brit. Assoc.), and Coll. Guard, vol. xxviii. p. 304.

The coal-fields noticed are in the Tuscan Maremma, are of Miocene age, and have been broken up into small basins by upheaval caused by intrusion of igneous rocks. The coal is good. The succession of beds in the Montebamboli basin is given, and the Casteani mines are noticed, with an analysis of the coal. W. W.

Fric, Dr. A. Geologischer Bilder aus der Urzeit Böhmens. Prag.

A series of views giving supposed restorations of Bohemia in the successive geological periods.

Friedrich, O. O. Kurze geognostische Beschreibung der Südlausitz und der angrenzenden Theile Böhmens und Schlesiens. [Geological description of parts of Bohemia and Silesia.] Geol. map. 4to. Dresden.

Fuchs, Theo. Bemerkungen zu Herrn A. Garnier's Mittheilung "Note sur les couches nummulitiques de Branchai et d'Allons." [On M. Garnier's paper, "Notes on the Nummulitic beds of Branchai and Allons."] Verh. k.-k. geol. Reichs. pp. 57, 58.

Discusses the views of Garnier (Bull. Soc. Géol. France, 1872, xxix. p. 484), who places these beds in the Lower Eocene; whereas Fuchs considers them to be of Oligocene age. H. A. N.

——. Der "Falun von Salles" und die sogenannte "jungere Mediterranstufe" des Wiener Beckens. [The Faluns of Salles and the newer Mediterranean Beds of the Vienna Basin.] Verh. k.-k. geol. Reichs. pp. 105–111.

Shows that the marine Miocene beds of the Vienna Basin, to which Suess gave the name of "Newer Mediterranean Beds," are really the equivalent of the "Faluns of Salles," near Bordeaux. This view is supported by full lists of fossils. H. A. N.

——. Beiträge zur Kenntniss der Horner-Schichten. [Contributions to a knowledge of the "Horner-Schichten."] Verh. k.-k. geol. Reichs. pp. 113–115.

The so-called "Horner-Schichten" are Miocene, and referable to the "Older Mediterranean Beds" of Suess. The author gives lists of fossils from these deposits, or from beds which he believes to be referable to this horizon, from places imperfectly explored before. H. A. N.

——. Die Stellung der Schichten von Schio. [Position of the Schio beds.] Verh. k.-k. geol. Reichs. pp. 130–132.

Gives full lists of fossils from the Tertiary beds of Schio, and shows their position relatively to those of Italy, France, Hungary, &c.

——. Reise-Notizen aus Italien. [Notes on a journey in Italy.] Verh. k.-k. geol. Reichs. pp. 218–223. Translated in Bol. R. Com. Geol. Ital. pp. 226–233.

In the translation, Dr. A. Manzoni adds some notes, showing that the Rosignano limestone belongs to the top of the Miocene, and that the pretended Nummulite of Parlascio does not belong to this genus, the beds there not being Miocene, but Pliocene. E. B. T.

——. Das Alter der Tertiärschichten von Malta. [Age of the Tertiary beds of Malta.] Sitzungsb. k. Ak. Wiss. Wien, math.-nat. Cl. Abth. i. Bd. lxx. pp. 92–105.

The Tertiary series of Malta consists of 2 groups, quite conformable to each other, but whose fossil contents are very distinct; *e. g.* the large Clypeasters come from the upper, and the small *Scutellæ* from the lower. The "Upper Limestone" of authors constitutes the top of the first group; it is said to be very similar, even lithologically, to the Leithakalk of the Vienna Basin, and its fossils agree with the same. On Gozzo, below the Leitha-limestone, come greensands with Bryozoa, *Heterostegina*, Echinidæ, Pectens, &c., in every respect like the Neudorf sands of the Vienna Basin. Below this again are marls, with Pectens, like the Baden clays of the Vienna Basin. The second group begins with the "Calcareous Sandstone" of authors, and is paralleled with the "Bormidian" of Sismonda or Aquitanian of others. It is said to be very similar to the Pecten-beds of Schio (Lombardy); the scallops are quite different from those of the upper group. *Carcharodon*-teeth are abundant here. The "inferior limestone" is the lowest member; it contains large Orbitoideæ and Operculinæ, and small *Scutellæ*, as characteristic fossils. E. B. T.

Fuchs, Th. Ueber das Auftreten von Miocänschichten vom Character der sarmatischen Stufe bei Syrakus. [Occurrence of Miocene beds near Syracuse, with the character of the Sarmatic stage.] Sitzungsb. k. Ak. Wiss. Wien, math.-nat. Cl. Abth. i. Bd. lxx. pp. 106–109.

The plateaux W. of Syracuse, in some places 600 feet high, consist entirely of Miocene Beds, very similar in all respects to the "Leithakalk" of the Vienna Basin, sometimes being full of Nullipores, Corals, &c., at other times with the Clypeasters, *Echinolampas*, Pectens, &c. characteristic of that deposit. A higher member, however, is seen in a few localities (overlain unconformably by the Pliocene), which has the appearance of belonging to the Sarmatic stage. It has the fine oolitic texture of those beds. Moreover there is a complete absence of the Nullipores, Corals, Echinoderms, &c., but presence of numerous leading Sarmatic mollusca. E. B. T.

——. Die Tertiärbildungen von Tarent. [Tertiary formations of Tarento.] Sitzungsb. k. Ak. Wiss. Wien, math.-nat. Cl. Abth. i. Bd. lxx. pp. 193–197.

The Tertiaries of Tarento are Pliocene; they extend to but a small height above the sea, and rest on Hippurite limestone. At the top they consist of Nullipore limestone and conglomerates, very rich in fossils. Next come clays with *Buccinum semistriatum*, *Natica helicina*, &c.; below are Bryozoa limestones with Terebratulæ and Echinidæ.

E. B. T.

Garrigou, Dr. F. Résumé géologique accompagnant la carte géologique de l'Ariège, de la Haute-Garonne, de la partie Ouest de l'Aude et de la partie E. des Hautes-Pyrénées. [Geology of part of the Pyrenees.] Bull. Soc. Géol. France, 3 ser. t. i. pp. 418–439 (7 woodcuts).

An explanation of a large unpublished geological map of about one third of the Pyrenees, drawn from the author's researches. Much of the granite hitherto regarded as intrusive is shown to be interstratified. The rocks represented in the map are ante-Silurian Granites, Transition rocks, Carboniferous, Trias, Infra-Lias, Jurassic, Lower Cretaceous, Middle and Upper Cretaceous, Garumnian, Eocene, and Miocene (with new facts of importance).

Garrigou, Dr. F. Calcaire carbonifère des Pyrénées. Marbres de Saint-Béat et du Mont (Haute-Garonne). [Carboniferous Limestone in the Pyrenees. Marbles of the Haute Garonne.] Compt. Rend. t. lxxix. pp. 53–56.

Insists on the Lower Carboniferous age of the band of limestone known on the northern flank of the Pyrenees as "marbres de St. Béat." These beds had been supposed to be Jurassic, and also pre-Carboniferous. The presence of Carboniferous formations in the Pyrenees had been said to be impossible. G. A. L.

——. Réponse à M, Leymerie, au sujet du calcaire carbonifère des Pyrénées et des marbres de Saint-Béat. [Reply to M. Leymerie on the Carboniferous Limestone of the Pyrenees.] Compt. Rend. t. lxxix. pp. 328, 329.

The crystalline limestones in question form part of "the Carboniferous band, the place of which has been written both by Stratigraphy and by Palæontology, in the Pyrenean rock-series." G. A. L.

Gaspard, A. Oscillations de la côte à Dunkerque. [Oscillations of the Dunkirk coast.] Ann. Soc. Géol. Nord, 1870–74, pp. 40, 41.

Extract from a letter calling attention to a bed of peat 6·4 metres below mean sea-level, covered by a great thickness of sand, in which a few thinner beds of peat are met with. A bone arrow-head and an antler have been found on the top of the lower bed. G. A. L.

Gastaldi, B. Studii geologici sulle Alpi occidentali (parte secunda). [Geological studies on the Western Alps.] Memorie R. Com. Geol. Ital. vol. ii. pt. 2, pp. 5–59 (2 plates, sections).

Reviewing what has been written on the serpentines of the Pyrenees and elsewhere, and comparing therewith his own observations in the Alps between Briançon and Lago Maggiore, the author comes to the following conclusions:—that the older, or fundamental, gneiss is the oldest rock in the Alps (perhaps L. Laurentian); that above this comes the great mass of green-tinted rocks, serpentines, diorites with subordinate mica-schist, newer gneiss, and saccharoid limestones (perhaps U. Laurentian to Cambrian); that the succeeding quartzites, sandstones with anthracite, dolomites, and gypsum are Palæozoic; that there are no strictly plutonic rocks, but that all the above are sedimentary rocks metamorphosed; and that it was the central fundamental gneiss which, being raised in the solid state, lifted all the other rocks. E. B. T.

Godefrin, —. Bois silicifié et grès, dans le sable landénien de

Hersin-Coupigny. [Silicified wood and sandstone in Landenian sand.] Ann. Soc. Géol. Nord, 1870–74, p. 4.

Note of occurrence.

Gorceix, —. Phénomènes volcaniques de Nisyros. [Volcanic phenomena of Nisyros.] Compt. Rend. t. lxxviii. pp. 444–446.

A description of the eruption of 1873 on this island. Analyses of some of the aqueous fumerolles are given, and a sketch of the geological structure of Nisyros and some of the neighbouring islands. G. A. L.

——. Aperçu géologique sur l'île de Kos. [Geology of Cos.] Compt. Rend. t. lxxviii. pp. 565–568; see also Bull. Soc. Géol. France, 3 sér. t. ii. pp. 146, 147.

The island consists of a ridge of crystalline limestones and shales of Secondary age, forming a core, around which are grouped the Tertiary beds, rich in fossils, and in which are volcanic rocks of various ages. The last are described, and two analyses of gaseous emanations are given. None of the Tertiary beds appear to be earlier than Lower Pliocene. G. A. L.

——. Note sur l'île de Cos et sur quelques bassins tertiaires de l'Eubée, de la Thessalie et de la Macédoine. [The island of Cos and some Tertiary basins of Eubœa, Thessaly, and Macedon.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 398–403.

A summary of the deposits of the places mentioned under the following heads:—Isle of Cos—Secondary rocks, volcanic rocks, and Tertiaries (Miocene and Pliocene); Isle of Eubœa—basins of Limni and Messondia (Miocene); Thessaly and Macedon—basins of Katherini, Poydendri, &c. (Miocene). In Cos a marine Pliocene deposit is seen abutting against the Miocene or Infra-Pliocene lacustrine beds. G. A. L.

Gosselet, Prof. J. Le progrès de la Géologie dans le Nord depuis dix ans. [Progress of Geology in the Département du Nord.] Rev. Sci. pp. 345–349; and Ann. Soc. Géol. Nord, 1870–74, pp. 86–100.

——. Tête de ruminant dans une formation récente près de Valenciennes. [Head of a ruminant from a recent deposit near Valenciennes.] Ann. Soc. Géol. Nord, 1870–74, p. 6.

Note of occurrence.

——. Tourbe sur un sable fluviatile à Lille. [Peat on a river-sand at Lille.] Ann. Soc. Géol. Lille, 1870–74, p. 8.

Note of occurrence. A bronze axe found at the junction of the beds.

——. Puits à Noyelle-Godeau. [Well at Noyelle-Godeau.] Ann. Soc. Géol. Nord, 1870–74, p. 29.

Depth 100 metres; at 90 metres the *dièves* were reached.

——. Terrains tertiaires inférieurs dans le bassin des Flandres. [Lower Tertiary beds in the Flemish basin.] Ann. Soc. Géol. Nord, 1870–74, pp. 64–66.

The Upper Landenian is represented near Lille by the sands of Ostricourt, the equivalents of the Bracheux sands. The clay of Flanders, which is the Lower Ypresian of Dumont, is divided into two horizons (the clay of Orchies and the clay of Roubaix), = Cuise sands of the Paris basin and also = London Clay. The author admits the term "clay of Flanders," but notes that it corresponds exactly to the Suessonian of D'Orbigny. G. A. L.

Gosselet, Prof. J. Etudes relatives au bassin houiller du Nord de la France. [Coal-basin of the N. of France.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 409–417, 6 figures in text.

As the result of researches in the Boulonnais, the author proves, on palæontological grounds, that some of the beds which Prof. Prestwich regarded as Carboniferous Limestone in reality belong to the Coal Measures. According to M. Gosselet, the same succession of the Carboniferous rocks obtains in the Boulonnais as in Belgium. The fact that at Hardinghem the pits are sunk through Carboniferous Limestone before reaching the coal, was formerly explained by the author on the hypothesis of a reversed dip. This, however, has been disproved; and he now believes in the existence of a fault, bringing the Coal Measures into contact with the Carboniferous Limestone, and having an extremely oblique or nearly horizontal hade.

The second part of the paper consists of an inquiry into the stratigraphical relations of the Devonian rocks bordering the Carboniferous regions of Belgium and the north of France. Exception is taken to the universal application of Prof. Ramsay's conclusions with regard to the inland origin of red rocks, but not to the special cases which called them forth. G. A. L.

——. De l'extension des couches à *Nummulites lævigata* dans le Nord de la France. [Extension of the *Nummulites-lævigata* beds in the N. of France.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 51–59, pl. iii., 3 figs. in text; abstract, under a different title, in Ann. Soc. Géol. Nord, 1870–74, p. 36.

From a study of the *Nummulites-lævigata* beds, which he considers to have been weathered in place, the author confirms M. Hébert's surmise, that at the time of their formation the inland sea of the Paris basin communicated with the Flemish sea, running across the entire length of the Department of the Nord. To this paper M. de Lapparent adds a note, in which he argues, on chemical grounds, that the siliceous grit in which the Nummulites are found is not the original matrix in which they were deposited, which he says was a clay. G. A. L.

——. Sur l'âge des silex, dits *Rabots* de Mons. [Age of the flints, known as *Rabots*, at Mons.] Bull. Soc. Géol. France, 3 sér. t. ii, pp. 59, 60, and (under a different title) Ann. Soc. Géol. Nord, 1870–74, p. 36.

The author identifies, on palæontological grounds, the flint beds of Mons and Obourg with the *Ammonites-Brongniarti* zone of the Chalk

Marl. Between the marly Chalk and the white clay with *Belemnites* there are considerable denudations. G. A. L.

Gosselet, Prof. J. Carte géologique de la Bande Méridionale des Calcaires Dévoniens de l'Entre Sambre et Meuse. [Geological map of the southern band of Devonian limestones between the Sambre and the Meuse.] Bull. Acad. Roy. Belg. 2 série, t. xxxvii. no. 1, 36 pp., map, 1 plate of sections and 6 figs. in text.

The divisions described and mapped in this band of Devonian rocks are:—Limestone of Givet, with *Stringocephalus Burtini*; shales and limestone of Couvin, with *Calceola sandalina*; shales and limestone of Frasne, with *Rhynchonella cuboïdes*; and shales of Matagne, with *Cardium palmatum*. G. A. L.

——. Etudes sur le gisement de la Houille dans le Nord de la France. [Coal Measures in the north of France.] Bull. Soc. Indust. N. France, no. 6, 24 pp., 2 plates, 6 figs. in text.

Explains the formation of the Carboniferous basins of Namur or Valenciennes and of Dinant or Avesnes, which are separated by the Siluro-Devonian ridge of Condros. An account of the great fault which coincides with this ridge is given, showing how, by means of its great obliquity, the Coal Measures are brought under rocks of Carboniferous Limestone and Devonian age. M. Gosselet believes the sub-Wealden boring to be at a favourable point for striking either the continuation of the great Franco-Belgian coal-basin, or, at all events, very neighbouring rocks. G. A. L.

Gosselet, J., and — **Bertaut**. Etude sur le Terrain Carbonifère du Boulonnais. [Carboniferous beds of the Boulonnais.] Mém. Soc. Sci. Agr. et Arts, Lille, 3 sér. vol. xi. Ann. 1873 [pub. 1874?], 27 pp., map and 3 plates.

The divisions recognized in the Carboniferous series of the Boulonnais are:—Carboniferous Limestone: 1, dolomite of Hure; 2, limestone of Haut-Banc, with *Productus cora*; 3, Napoleon limestone, with *Productus undatus*; and, 4, *Productus-giganteus* limestone. Coal Measures: 5, sandstone of the Hardinghem plains; and, 6, coal-bearing shales of Locquinghen. Where the limestone 1 is found *overlying* the coal-seams of 6, the authors explain the fact by the hypothesis of a fault having a nearly horizontal hade (see p. 67). G. A. L.

Gruner, —. Sur le Carbonifère et l'anthracifère du Roannais. [Carboniferous and anthraciferous rocks of the Roannais.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 445, 446.

Notes on the Carboniferous Limestone of Régny, which dips to the north and to the south under a thick formation of anthraciferous grits, which the author likens to a series of pophyritic tuffs. G. A. L.

——. Terrains de transition du Roannais &c. [Transition rocks of the Roannais &c.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 448–450.

The following Table gives the writer's views on the concurrent phenomena of these rocks in this region:—

Sedimentary.	*Eruptive.*
....	Quartziferous Eurite.
Coal Measures proper.	....
....	Quartziferous Porphyry.
Anthraciferous formation.	....
....	Granitoid Porphyry.
Carboniferous Limestone ('*Wacke*'). Azoic schists.	....
....	Eruptive Granite.
Mica schists and gneiss.	

G. A. L.

GRUNER, —. Compte-rendu de la course de Régny. [Excursion to Régny.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 454–459, pl. x.

——. Compte-rendu de la course faite à Cordelle et au plateau de Neulize. [Excursion to Cordelle and to the plateau of Neulize.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 460–464.
Excursion notes, chiefly on porphyritic rocks.

——. Compte-rendu de la course de Charlieu. [Excursion to Charlieu.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 469–474, 2 figs. in text.
Excursion notes, chiefly on Jurassic rocks. Two sections given.

——. Compte-rendu des courses faites dans les montagnes de la Madelaine. [Excursions in the Madelaine hills.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 484–496, 1 fig. in text.
An account of sections &c. observed in a three-days' excursion.

GUILLIER, —, and — DE TROMELIN. Note sur le terrain silurien de la Sarthe. [Silurian beds of the Sarthe.] 8vo. Le Mans, 12 pp.

GUMÆLIUS, O. Om "trappskölen" i Sala grufva. [Trap-dykes in the Sala mine.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 162–166, pl. xv.
Section given showing the relative position of the Trap at the different levels of the mine. "Trappskölen" is apparently a local mining term for trap-dykes. G. A. L.

——. Profil genom de lösa jordlagren vid södra ändran af sjön Möckeln i Örebrö län. [Section of Drift-beds at Lake Möckeln, in the Örebrö government.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 232, 233, fig. 26, pl. xxiv.
Description and figure of section of drift-clay, sand, and angular gravel.

——. Snäckbankar i Ångermanland. [Shell-banks in Ångermanland.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 233, 234.

Note of Post Glacial shell-deposits, at least 250 feet above sea-level, containing three marine, one brackish, and one freshwater species.

Gumælius, O. Rullsten i Saltholmskalk. [Rolled pebble in Saltholm limestone.] Geol. fören. Stockholm, Förhandl. bdt. i. p. 234.

——. Några iakttagelser om urlakningar och urlakningsprodukter i Skåne. [Ore-deposits and products in Scania.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 235–237.

——. Om mellersta sveriges Glaciala Bildningar.—I. Om krosstensgrus, glacialsand och glaciallera. [Glacial Deposits of Central Sweden.] Sveriges Geol. undersök. pp. 1–36, with *résumé* in French, pp. i–ix, 3 plates. Reprinted from the Supplement to the K. Svenska Vet.-Akad. Handlingar.

After giving an account of the work of previous observers, the writer states that both the glacial clay and the glacial sand are found above the bottom-gravel, which in this district reposes on the rock. After their deposition these stratified formations were partially destroyed, crushed, and twisted in a striking manner. What is left of them is covered by the more recent angular gravel, which, however, is seen often lying immediately upon the older gravel. In its turn this more recent gravel is covered by a second newer set of glacial sands and clays underlying the postglacial deposits. This arrangement disproves in part the theory that the angular gravel is the oldest of the post-Tertiary beds of Sweden. The plates consist of 12 coloured sections and one small contoured map (scale 1 : 50,000). G. A. L.

Gümbel, —. Geognostische Mittheilungen aus den Alpen. [Alpine Geology.] Sitzungsb. math.-phys. Classe K. baier. Akad. Wissens. Heft iii. pp. 177–203.

A description of the geological sections on the southern side of the Kaisergebirg in Bavaria, and an attempt to compare the relations of the beds in the Northern and the Southern Alps. The formations described are the Bunter sandstone, Muschelkalk, Partnach beds (Lower *Cardita*-beds), Wetterstein limestone, and the Raibl beds (so-called Upper *Cardita*-beds). Sections are given in woodcuts. F. W. R.

Hallez, Paul, — Lecocq, and — Savoye. Sur les affleurements tertiaires et quaternaires de l'Empempont, Emmerin et Seclin. [Tertiary and Quaternary outcrops of the Empempont hill &c.] Ann. Soc. Géol. Nord, 1870–74, p. 5.

Haniel, J. Ueber das Auftreten und die Verbreitung des Eisensteins in den Jura-Ablagerungen Deutschlands. [Jurassic Iron-ores of Germany.] Zeitsch. deutsch. geol. Gesell. Bd. xxvi. Heft 1, pp. 59–118.

A description of the distribution of iron-ores in the various zones of the Jurassic beds of Germany. It includes many analyses of the ores, and is accompanied by two plates, showing the correlation of the beds in various places. F. W. R.

Hébert [Prof. E.]. Comparaison de l'Eocène inférieur du Bassin de Paris, de Belgique et d'Angleterre. [Comparison of the Lower Eocene of Paris, Belgium, and England.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 27–31; and under a slightly different title, in Ann. Sci. Géol. t. iv. pp. 33 (1873).

Arrives at the conclusions shown in the following table of synchronism:—

		Paris Basin.	Belgium.	England.
Lower Eocene.	Upper Group.	Sands with *Nummulites planulata*.	Paniselian	Lower Bagshot Sands.
		Sands without fossils	Lower Ypresian	
		Wanting	Clay of Ypres	London Clay.
		Wanting	?	Oldhaven Beds.
		Plastic clay and lignites	Upper Landenian	Woolwich Beds.
		Sands of Bracheux	Lower Landenian	Thanet Sands.
		Denudation.	Denudation.	
	Lower Group.	Marl of Dormans	Marine Heersian marl.	Wanting.
		Conglomerate of Meudon.		
		Limestone of Rilly and strontianiferous marl of Meudon.	Upper Heersian sands.	
		Sand of Rilly	Lower Heersian sands.	
		Conglomerate of Nemours	Denudation.	
		Wanting	Limestone of Mons.	

There is a full abstract of this paper in Geol. Mag. dec. 2, vol. i. pp. 229, 230. G. A. L.

——. Age relatif des calcaires à *Terebratula Moravica* et du *Diphya*-Kalk, ou calcaire à *T. janitor* et *T. diphya*. [Relative age of the *Terebratula-Moravica* Limestone and of the *Diphya*-limestone.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 148–162, 4 figs. in text, pl. v.

This is chiefly an examination of Zittel's monograph on the fauna of Stramberg. The points urged are:—that the Gasteropoda of Stramberg are those of the *Terebratula-Moravica* limestones of the rest of Europe; that in the Alps of Eastern Switzerland the *Diphya*-limestone overlies the *T.-Moravica* limestones; that these two series are mixed together by Zittel; and that this confusion arises from a fault, bringing the two series into apparent continuity, being ignored by Zittel. The ages of the *Terebratula-Moravica* and *Am.-tenuilobatus* zones are next discussed. The former belongs, according to M. Hébert, to the Coral Rag, notwithstanding that M. Moesch regards it as post-Kimeridgian. The latter, which is usually considered as Kimeridgian, M. Hébert says is undoubtedly older than the Coral Rag of the north, and also older than the Alpine Coral Rag with *Diceras Lucii*. These conclusions are directly opposed to those of M. Neumayr. G. A. L.

Hébert [Prof. E.]. Documents relatifs au terrain crétacé du Midi de la France. Troisième partie. [Cretaceous Rocks of the South of France.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 465–493, pl. xvii. Since published more fully in Ann. Sci. Géol. (1875).

The particular object is the determination of the position of the sandstones of Uchaux, in the Vaucluse. The evidence adduced for this purpose is given under the following heads:—1. Northern and eastern portion of the Uchaux basin; sections from the neighbourhoods of Clansayes and Nyons are given here, and one of the region of the Mont Ventoux. 2. The southern and western portion (by M. Toucas), with sections from Orange to Lampourdier, from Salazac to St. Pancrace, and from St. Pancrace to Bagnols. 3. Central portion of the basin (by Messrs. Hébert and Toucas), with sections from Mondragon to Bollène, from Mondragon to Piolenc, from Boncavail to Piolenc, from la Taladette to Soumelongue, and from Noyères to Bollène. 4. Résumé and conclusions (by Messrs. Hébert and Toucas). The general section of Cretaceous rocks of the district is as follows:—first series *Craie glauconieuse*, in two divisions; second series *Uchaux grits*, with three divisions, and *Mornas grits*; third series *sands and lignitiferous grits of Polienc*. 5. The Upper Cretaceous of Uchaux, compared with that of the other Cretaceous basins of France. A table shows the equivalency of the members of the basin of Uchaux with those of Southern Provence, Aquitaine, Touraine, and of Northern France. G. A. L.

Heim, Dr. **Albert**. Ueber die Schliffe an den Porphyrbergen von Hohburg. [Polished surfaces on the porphyry hills of Hohburg.] N. Jahrb. Heft ix. pp. 953–959.

Naumann described the striated surfaces on the porphyry rocks at Hohburg, near Wurzen, in Saxony, and suggested that they might be due to glaciation. The present paper refutes this explanation, and maintains that these surfaces cannot be cited in proof of the continental glaciation of North Germany. They may be due to peculiarities of rock-structure, developed by the action of blown sand. F. W. R.

Helmhacker, R., and E. **Weiss**. [Nürschau Coal.] N. Jahrb. Heft ix. pp. 963, 964.

Letter stating that the Nürschau coal-bearing rocks in the Pilsen basin are of Carboniferous and not Permian age.

Héna, T. Note sur des brèches rouges dans les Côtes du Nord. [Red breccias in the Côtes du Nord.] Compt. Rend. t. lxxviii. p. 1370.

Calls attention to red breccias, composed of quartz fragments bound by a clayey paste, and to the presence on various points of the coast of Finistère of flint pebbles, which, the writer argues, point to the former presence of Chalk in the neighbourhood. G. A. L.

Hirsch, J. Les voies navigables dans l'Est de la France. [Canal-system of Eastern France.] Compt. Rend. 2 sess. Assoc. Franç. pp. 169–176, pl. ii.

The plate consists of a small map of the country between Brussels and the Lake of Neuchâtel, showing the deposits of coal, iron, and salt.

Hœrnes, Rudolph. Kohlenführende Tertiärablagerungen aus der Umgebung des Ivanczicagebirges in Croatien (Sotzka- und Hornerschichten). [Coal-bearing Tertiary deposits, Croatia.] Verhandl. k.-k. geol. Reichs. pp. 239–242.

Treats of these deposits with special reference to their *Mollusca*, and the divisions founded on the study of these fossils.

——. Aufnahme in Oberen Villnöss-Thale und in Enneberg. [Survey in the Upper Villnöss valley and in Enneberg.] Verh. k.-k. geol. Reichs. pp. 347–349.

——. Das Vorkommen von Leitha-Kalk in der Ziegelei bei Möllersdorf. [Occurrence of Leitha Limestone in Clay-pits at Möllersdorf.] Verh. k.-k. geol. Reichs. pp. 369, 370.

Gives a section of the clay-pits at Möllersdorf, and points out the occurrence of the " Leitha Limestone " therein.

——. Geologischer Bau der Insel Samothrake. [Geological Structure of Samothrace.] Denks. k. Ak. W., Bd. xxxiii. pp. 12, 2 plates.

The island consists of old crystalline rocks forming a chain of mountains running S.W. and N.E., and overlain unconformably by formations of Eocene and later age. Accompanied by a geological map.
F. W. R.

Holmström, L. Bidrag til kännedomen af moränbildningarne på Hven och nörliggande skånska kust. [Moraine-deposits of Hven and of the adjacent coast of Scania.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 96–101.

Houzeau de Lehaie, A. Guide au Mont Panisel. Mons. 4 pp., map and two sections.

Geological, with list of fossils. The Paniselian lies unconformably on the Ypresian. Its fauna makes it represent part of the Calcaire grossier.

Huguenin, —. Note sur la zone à *Ammonites tenuilobatus* de Crussol (Ardèche). [*Am.-tenuilobatus* zone of Crussol.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 519–527.

An abstract. Lists of fossils and a section are given, the writer's conclusion being that as Oxford-Clay species are not so numerous in the zone in question as those of the Coralline Oolite, it should be ranked with the latter. The beds described consist chiefly of rapidly alternating grey limestones and marls. G. A. L.

Hummel, David. Om Rullstensbildningar. [On Pebble-deposits.] Sveriges Geol. undersök. pp. 1–34; with *résumé* in French, pp. i–vi, 2 plates. Reprinted from the Supplement to the K. Svenska Vet.-Akad. Handl.

The *åsars* of pebbles in Småland owe their origin to continental ice. The gravel-beds were formed by running water acting through the crevasses upon the bottom-moraines of glaciers and of land-ice generally, the direction of the ridges or åsar of this gravel being determined by the vaulted channels which exist at the base of glaciers, and which thus become the original moulds in which the åsars were formed. The fact that the direction of the water-flow, when once it reached the bed of the glacier, depended solely upon the form of the ground accounts for the fact that these pebble-deposits are sometimes found trending in directions opposite to those of their parent ice-masses. The plates consist of two maps, one (on a scale of 1 : 200,000) showing the pebble-deposits of Halland and Småland, and the other (on a scale of 1 : 1,000,000) the same deposits in the Mälar basin. In both these maps the directions of the glacial striæ, which closely agree with those of the gravel-beds, are shown. G. A. L.

HUMMEL, DAVID. Beskrifning till Kartbladed "Trosa." Pp. 72, 3 plates (map and sections). Sveriges Geol. undersök. [Description of Map, No. 52. Swedish Geological Survey.]

JARDIN, ED. Voyage géologique autour de l'Islande, fait en 1866 sur la frégate la Pandore. [Geological voyage round Iceland.] Pp. 39, 2 plates. 8vo. Paris. [Reprinted from Bull. Soc. Académique.]

JERVIS, G. Cenni geologici sulle montagne poste in prossimità al giacimento di antracite de Demonte. 8vo. Turin.

——. I Tesori Sotterranei dell' Italia. Parte Seconda. Regione dell' Apennino e Vulcani attivi e spenti dipendentivi. [Subterranean Treasures of Italy. The Apennines and Volcanoes.] Pp. xviii, 624. 8vo. Turin. Lithograph and woodcut views.

JESPERSEN, M. Scania and Bornholm. Geol. Mag. dec. 2, vol. i. pp. 528, 1 fig. in text (section).

In the island of Bornholm is found the same formation as the coal-bearing one of Scania. The thickness at Bornholm is probably 2000 feet, including 20 coal-seams, from a few inches to 10 feet thick, some of which are worked. The age of the beds is disputed; but they are low down in the Secondaries. G. A. L.

JOHNSTRUP, F. Om Hævningsfænomenerne i Möens Klint. [On the phenomena of dislocation and upheaval at Möens Klint.] 11 Skand. Natur. Forhandl.

——. Œfversigt over de palæozoiske Dannelser paa Bornholm. [Palæozoic rocks of Bornholm.] 11 Skand. Natur. Forhandl.

——. Ueber die Lagerungsverhältnisse und die Hebungsphänomene in den Kreidefelsen auf Möen und Rügen. [Chalk of Möen and Rügen.] Zeit. deutsch. geol. Gesell. Bd. xxvi. pp. 533–585, 2 plates.

A description of the Chalk of Möens Klint, with special reference to its contortions. This is a reproduction of the author's paper read at the Meeting of Scandinavian Naturalists at Copenhagen in 1873, followed by a shorter notice of subsequent observations on the Chalk of Rügen. F. W. R.

JONES, Prof. T. R. On the Valley of the Vézère, Périgord, its Limestones, Caves, and Pre-Historic Remains. Proc. Geol. Assoc. vol. iii. no. 5, pp. 207–210.

The Vézère rises in hills of metamorphic rocks, crosses some patches of Coal Measures and Red Sandstone, succeeded by Rhætic and Jurassic rocks, and then runs over almost horizontal Cretaceous rocks, and at last over Tertiary beds. The caves are in Jurassic and Cretaceous limestones; and in many of them stone and bone implements have been found. [See 'Reliquiæ Aquitanicæ.'] It is inferred that in the time of the cave-folk the climate must have been colder than now. W. W.

JONES, Sir WILLOUGHBY. M. E. Frossard's Cavern Explorations in the Pyrenees, abridged from his paper read to the Société Ramond. (Norwich Geol. Soc.); 'Norwich Mercury,' Dec. 5.

The caverns, which have now been quarried away, were in the limestone rock of Aurensan. Remains of mammals, birds, reptiles, fish, and mollusks were found, and many bones of man, besides stone implements. On a fragment of slate is a rude outline of a man clad in a coat of hard skin. W. W.

JULIEN, —. Sur une faune carbonifère marine, découverte aux environs de l'Ardoisière, dans la vallée du Sichon (Forez). [Carboniferous marine fauna in the valley of Sichon (Lyonnais).] Compt. Rend. t. lxxviii. pp. 74–77.

The true position of the beds forming the basin of Sichon was not known until the author found in beds of limestone forming the upper part of the series a rich fauna of Carboniferous-Limestone age. A list of the fossils found is given, among which some are marked as new species, but not described. (See below, DE KONINCK.) G. A. L.

KARSTEN, H. [A Cave at Thayingen, Switzerland.] N. Jahrb. Heft iii. pp. 265–268.

Letter describing Herr Merk's recent researches in the cave known as "Kessler's Loch," near Thayingen. A bed of bone-breccia has yielded numerous relics of human workmanship, including a figure of a reindeer engraved on bone. Below the breccia is a bed of marl in which the remains of the Mammoth have been found, but not associated with any traces of human occupation. F. W. R.

——. [Cave in Switzerland.] N. Jahrb. Heft iii. pp. 268, 269.

Letter on excavations in a cave near Schaffhausen. A bed of breccia, almost without bones, yielded fragments of pottery like those from pile-dwellings. Below the breccia was a dark clayey bed with bones, worked flints, &c. F. W. R.

KONINCK, L. G. DE. Note sur les fossiles carbonifères decouverts dans la vallée du Sichon (Forez) par M. Julien. [Carboniferous fossils found in the Sichon valley.] Ann. Soc. Géol. Belg. t. i. Mém. pp. 3–7.

A list of 49 species, showing that the beds belong to the upper part of the Carboniferous Limestone series.

LACROIX, G. Coupes hydro-géologiques du département de Lot-et-Garonne. 3^{e} feuille. [Hydro-geological sections of the Department of Lot-et-Garonne.] Paris.

LADRIÈRE, —. Craie inférieure et Gault de Saint-Waast-les-Bavai. [Lower Chalk and Gault of Saint-Waast-by-Bavai.] Ann. Soc. Géol. Nord, 1870–74, pp. 22, 23.

Two quarry-sections are given.

——. Présence de la grauwacke et des schistes à calcéoles dans le canton de Bavai. [Grauwacke and *Calceola*-schists in the Canton of Bavai.] Ann. Soc. Géol. Nord, 1870–74, p. 25.

Note of occurrence.

LAMAIRESSE, —. Études hydrologiques sur les monts Jura. [Hydrological studies on the Jura Mountains.] Pp. 176, 1 plate. 4to. Paris.

Contains much geological information.

LAPPARENT, A. DE. Note sur la découverte du terrain Carbonifère faite à Saint-Nicolas-de-Rougemont, par M. l'Abbé Raboisson. [Discovery of Carboniferous rocks at St. Nicolas-de-Rougemont.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 121, 122.

A continuation of the band of Carboniferous beds so well known at Bourback on account of the beauty of their vegetable remains, has been discovered by M. Raboisson, lying between Permian Red Sandstones above and Grauwacke schists of uncertain age below. The beds consist of shaly sandstones containing plants. G. A. L.

——. Note sur les gisements de sable et d'argile plastique du Vermandois et du Cambrésis. [Deposits of sand and plastic clay of the Vermandois and the Cambrésis.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 134–141, 3 figs. in text.

The Lower Eocene or Landenian, on the plateaux which divide the Ile de France from Flanders, is often found in depressions of the Chalk, thus giving rise to all kinds of differences of level between these two formations. The author regards these as mere pockets of sand and clay belonging to the lignite-and-sand formation of the Noyonnais and of the Laonnais, and not as the lowest Eocene beds, deposited upon the denuded and ravined surface of the Chalk. G. A. L.

LAUBE, Dr. N. Jahrb. Heft v. pp. 526, 527.

Letter calling attention to the description of the Mansfeld Kupferschiefer and associated beds, by Mathesius in 1564. The information was probably obtained from Luther. F. W. R.

LAUBE, G. C. Notizen von einer Reise in Skandinavien. [Notes on Scandinavia.] Lotos, Feb. Mar. 1874. Noticed in N. Jahrb. 1875, p. 319.]

Describes the Quaternary deposits of Scandinavia, the deposits of iron-ore in Sweden, and the pyrites of Fahlun.

Lebour, G. A. Notes on further Researches on the Natural Pits of Hainaut, with Remarks on their probable origin. Trans. N. Eng. Inst. Eng. vol. xxiii. pp. 95–102; discussion, pp. 102–106, plate xxvii.

Supplementary to a paper by Mr. J. B. Simpson, in a previous volume. Its object is to clear up some points upon which further information was required. Mr. Lebour was enabled to supply this information through notes from M. Cornet.

The natural pits are circular hollows traversing the Coal Measures, filled with materials which have fallen from above. It was shown that the pits traverse the Cretaceous Beds which overlie the Coal Measures; but that, so far as is known, they do not penetrate the Tertiaries. The pits show no tendency to narrow downwards; some are known to increase in diameter in that direction.

The thickness of the beds overlying the Carboniferous Limestone precludes the idea of these pits being swallow-holes. It was suggested that they are the "vents" of trap, the sheet of trap erupted through them having been removed by denudation, and the trap in the vents having been likewise carried away by the long-continued action of springs.
W. T.

Lechb, W. Anteckningar om de lösa jordlagren vid Travemünde. [Quaternary beds at Travemünde.] Œfver. K. S. Vet.-Akad. Förhandl. no. 5.

Lecocq, Gust. Dépôts laissés par une inondation de la Deûle. [Deposits left by an overflow of the Deûle.] Ann. Soc. Géol. Nord, 1870–74, pp. 27, 28.

Note of sediment a foot thick.

Lenz, Dr. Oscar. Geologische Notizen aus der Fruska-Gora in Syrmien. [Geological notes on the Fruska-Gora in Syrmia.] Verh. k.-k. geol. Reichs. pp. 57–60.

Describes certain sections of the Tertiary deposits.

——. Die erratischen Erscheinungen im nördlichen Vorarlberg. [Glacial Phenomena in Northern Vorarlberg.] Verh. k.-k. geol. Reichs. pp. 85, 86.

Notes the phenomena produced by the old glacier of Graubündt, which in its former extension filled the valley of the Rhine, and has left many traces of its presence.
H. A. N.

Levallois, —, and — Bayan. Sur le terrain jurassique des environs de Charlieu. [Jurassic series near Charlieu.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 474–479, plate x.

Notes of excursions, with short lists of fossils found, &c.

Lévy, Michel. Note sur les Roches porphyriques du terrain anthracifère. [Porphyritic rocks of the anthraciferous series.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 464–467.

Discusses the relative ages of these rocks. The writer believes that a series of special eruptions more extensive than those of the granitoid porphyry itself took place during the deposition of the "anthraciferous grits" of Roanne, and that they brought to light rocks having a porphyritic paste, of which there were none, properly speaking, in the granitoid porphyry. G. A. L.

Leymerie, A. Note 1° sur les terrains supérieurs de la Montagne-Noire; 2° sur l'ensemble des dépôts suprà-nummulitiques du bassin de Carcassonne. [1. Upper Beds of the Montagne-Noire; 2. Suprà-nummulitique deposits of the Carcassonne Basin.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 68–80, plate iv.

1. A brief description of the relatively recent beds resting unconformably on the deposits at the foot of the southern flank of the Montagne-Noire; these beds have a low dip, and have probably not been disturbed since their deposition. The author divides them into two groups, as follows:—*Eocene*, Carcassian, lacustrine, and Nummulitic Beds, marine; *Cretaceous*, Garumnian, lacustrine.

2. A detailed description of the upper lacustrine series named "Carcassian" by the author. G. A. L.

——. De l'âge et de la position du marbre de Saint-Béat (Haute-Garonne). [Age and position of the marble of Saint-Béat.] Compt. Rend. t. lxxviii. pp. 1629-1635.

This marble had hitherto been regarded by geologists as a metamorphosed Secondary Limestone. The author believes it to be pre-Carboniferous, and to belong to the same series as the Limestone of Labourd rather than to that of the Laruns Limestone, which has been shown by fossil evidence to be Carboniferous. The relation of the rock to the neighbouring granite and its lithological characters chiefly led the author to his conclusion, which he does not, however, hold to be thoroughly established. G. A. L.

——. Réponse à une critique de M. Garrigou, contenue dans une Note récente, intitulée "Calcaire carbonifère des Pyrénées; marbres de Saint-Béat et du Mont." [Reply to a criticism by M. Garrigou, see p. 65.] Compt. Rend. t. lxxix. pp. 145–148.

The author denies the correctness of M. Garrigou's reference of the St.-Béat marbles to the Carboniferous Limestone, and persists in his opinion that they are pre-Carboniferous. G. A. L.

Liebisch, Th. Die in Form von Diluvialgeschieben in Schlesien vorkommenden massigen nordischen Gesteine. [Boulders of northern rocks in Silesia.] Pp. 39. 8vo. Breslau. [Noticed in N. Jahrb. 1875, p. 322.]

Notices that many crystalline rocks have been found as boulders in Silesia.

Linder, —. Observations sur les dépôts tertiaires du Médoc et du Blayais dans le département de la Gironde. [Tertiaries of part of the Gironde.] Bordeaux.

Linnarsson, G. Anteckningar om den kambrisk-siluriska lagerserien i Jemtland. [Cambro-Silurian series in Jemtland.] Geol. fóren. Stockholm Förhandl. bdt. i. 1872–74, pp. 34–47.

The writer, by means of a table, shows the order of the Cambrian and Silurian rocks in Jemtland (North of Sweden) and their relations to the classifications adopted by Angelin and Kjerulf, viz. in descending order:—1. *Pentamerus* limestone = Regio viii. *Encrinurorum* of Angelin and division 5 β of Kjerulf. 2. The presence of a representative of No. vii. (regio *Harparum*) of Angelin, and No. 5 α of Kjerulf, is doubtful in this district. 3. *Chasmops*-limestone, and 4. Middle Graptolite schists together = No. vi. (regio *Trinucleorum*) of Angelin and Nos. 4 and 3 β of Kjerulf. 5. Orthoceratite limestone = No. v. (regio *Asaphorum*) of Angelin and No. 3 α, in part, of Kjerulf. 6. Lower Graptolite schists = No. 3 α of Kjerulf in part. Unrepresented in Angelin's classification. 7. *Ceratopyge*-limestone = No. iv. (regio *Ceratopygarum*) of Angelin, and No. 2, in part, of Kjerulf. 8. Alum-schists = Nos. ii. and iii. of Angelin (regiones *Olenorum* et *Conocorypharum*) and No. 2, in part, of Kjerulf. 9. Quartzite = No. i. (regio *Fucoidarum*) of Angelin and No. 1 of Kjerulf. G. A. L.

Linnarsson, J. G. O. Ueber eine Reise nach Böhmen und den russischen Ostsee-Provinzen in Sommer 1872. [Journey to Bohemia and the Baltic Provinces of Russia.] Œfver. Vet. Akad. Förhandl. 1873, No. 5 [published in 1874].

The chief object of the journey was to study the Silurian deposits; and in this communication the author makes public the chief features of geological and palæontological interest which his time enabled him to observe both in the above-mentioned regions and in other localities which he visited *en route*. Throughout he takes special pains to parallel the Cambrian and Lower Silurian deposits of Bohemia and Russia with the corresponding formations in Sweden. H. A. N.

Lipold, M. V. Erläuterungen zur geologischen Karte der Umgebung von Idria in Krain. [Explanations to Geological Map of the Environs of Idria in Carinthia.] Jahrb. k.-k. geol. Reichs. Bd. xxiv. Heft 4, pp. 425–456; abstract in Verhandl. k.-k. geol. Reichs. p. 400, with coloured geol. map and plate of sections.

The author has fixed the age of the quicksilver-beds of Idria; these are Lower Triassic, but, owing to a remarkable dislocation and overlap, they seem to lie below the Carboniferous or Gailthal beds; their exact age is that of the Werfen and Guttenstein (Muschelkalk) beds. At one time the plant-bearing beds of the L. Trias were thought to be Lias and the Dolomites of the Trias above referred to the Cretaceous.

The chief formation in the district is the Trias, of which the following divisions are recognized:—(1) Wengen beds; under these are included sandstones and conglomerates (which may possibly be partly Permian) and beds with fossils corresponding to the Seiss beds of S. Tyrol. (2) Guttenstein group, contains beds whose fossils are similar to the Campile beds of S. Tyrol, dolomites and nodular limestones: the dolomites are over 300 feet in places and enter largely into the composition of the country. (3) Wengen beds; under these are included the plant-shales, tuffs, marls, and calcareous conglomerates, the characteristic fossils being *Posidon. Wengensis* and *Daonella Lommeli.* (4) Dolomites and limestones which succeed are, for petrographical reasons, placed under a separate head, as St.-Cassian beds; but it is not held that they are precisely parallel to the true St.-Cassian deposits. (5) Raibl beds, which yield a fine marble. Outside the area of the map, a higher group (Hauptdolomit) is seen with a thickness of 1300 feet. The Carboniferous beds occupy a narrow strip along a line of dislocation, the age of which must be subsequent to the deposition of all the Triassic beds; parallel to this are the veins of quicksilver, whose origin must therefore be connected therewith. E. B. T.

Lomnickiego, Prof. M. Sprawozdanie z badán geologicznych dokonanych w rokn 1873 w dolinach Zlotéj Lipy, Koropca, potoku Baryskiego i Strypy. [Report of the geological researches made in the valleys of Zlotéj Lipy, Koropca, the river Baryskiego and Strupy, with remarks by Dr. A. Altha.] Akademija umiejetnosci w Krakowie [Ac. Sci. Cracow], vol. viii. pp. 184–205.

Loretz, H. Das Tirol-Venetianische Grenzgebiet der Gegend von Ampezzo. Zeit. deutsch. geol. Gesell. Bd. xxvi. Heft 3, pp. 377–516.

A description of the geology of the country around Ampezzo in the Alps, including part of the border-land between Tyrol and Venetia. The memoir contains a mass of stratigraphical details. It is accompanied by a chromo-lithographed geological map, and by two plates of sections. F. W. R.

Lory, Charles. Note sur quelques faits de la structure des massifs centraux [or chaines centrales] des Alpes. Bull. Soc. Géol. France, 3 sér. t. i. pp. 397–405, and Arch. Sci. Phys. et Nat. vol. xlix. no. 194, pp. 89–102, plate of sections.

A vindication of his explanation of the fan-shaped structure and of the intercalated wedges of Jurassic limestone in the gneiss of the Bernese Alps against M. Studer's criticisms. G. A. L.

Lotti, B. Considerazioni geologiche sui dintorni di Bocheggiano e Gerfalco presso Massa Marittima. [Geological considerations on the environs of Bocheggiano, &c. near Massa Marittima.] Boll. R. Com. geol. d' Ital. pp. 222–226 (with a woodcut).

The hill of Bocheggiano contains a quartz-vein which separates the variegated schists (Jurassic?) from the Eocene rocks, but is said to be perfectly conformable to the latter, though altering them for a few feet at the contact; it contains copper-ore. The hill of Monticri contains the Jurassic schists, surmounted by Upper Jurassic limestones and sandstones. In other places the variegated schists are seen to lie upon the M. Lias (red marble with Ammonites), while above come Cretaceous and Eocene rocks. E. B. T.

——. Cenno sulla costituzione geologica della Comunità di Masse

Marittima. [Geological constitution of Massa Marittima.] Boll. R. Com. geol. d' Ital. pp. 284–294.

The beds noticed are:—Travertin, which forms a good building-stone, possibly reaching back to Pliocene times; Miocene with conglomerates and lignite (with the largest coal-mine in the kingdom); Eocene and Cretaceous, represented by the "*Alberese*;" Red limestone, which is probably Lias, below which, again, is white limestone, probably Infra-Lias. The cavernous limestone seen in some parts, Cocchi takes to be Trias; below are talcose schists. E. B. T.

Ludwig, Rudolf. Geologischen Bilder aus Italien. [Geological sketches from Italy.] Bull. Soc. Imp. Nat. Moscou, pp. 42–131, pls. i.–viii.

This paper is divided into four parts:—1 (pp. 44–81), a general account of the geological history of Italy, with notes of sections, &c.; 2 (pp. 81–88) treats of the Rock-salt deposits at Altomonte and Lungro, in Calabria; 3 (pp. 88–110), on the Copper, Lead, and Quicksilver ores of the Italian mainland; 4, on Boracic-acid springs, Sulphurous exhalations, Solfataras, and Alum, Asphalt, and Sulphur deposits. The plates contain 26 sections and sketch maps. G. A. L.

——. Die Steinkohlenformation im Lande der Don'sche Kosacken. [Carboniferous formation in the country of the Don Cossacks.] Pp. 37, with geological map and plate. 8vo. Moscow.

The author divides the Carboniferous formation on the Donetz into the following sections:—1. Calcareous group, with *Productus giganteus* and *Spirifer glaber*. 2. Ferruginous group, chiefly of sandstones and shales, with limestone, brown iron-ore, and coal. 3. Coal-bearing group, containing many beds of coal, with brown iron-ores, sandstone and shales, and but little limestone. 4. *Fusulina*-beds, containing shales, sandstone, and limestone, forming a transition to the overlying Permian. F. W. R.

Lundgren, Bernhard. Sandstensblock med *Paradoxides* från Gröningen. [Sandstone boulder with *Paradoxides* from Gröningen.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 44, 45.

——. Om i Skåne förekommande bildningar, som motsvara Brachiopodskiffern i Vestergötland. [Occurrence in Scania of deposits which correspond to the Brachiopod-schists of Western Gothland.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 156–159.

——. Om den vid Ramsåsa och Öfvedskloster i Skåne förekommande sandstenens ålder. [Age of the sandstones which occur at Ramsåsa and Öfvedskloster, in Scania.] Lunds Universitets Årsskrift, tom. x.

Maestre, Amalio. Datos geológico-mineros sobre algunos grupos de minas del distrito de Madrid. Bol. Com. Mapa geol. España, vol. i.

Notes on the mineral wealth of the provinces of Madrid, Toledo, and Avila.

Malaise, C. Note sur la description du terrain silurien du centre de la Belgique. [Silurian rocks of Central Belgium.] Ann. Soc. Mal. Belg. t. viii. Bull. des séances, pp. c–cv. Abstract of memoir in Mém. Ac. roy. Belg. 1873.

Martin, Jules. Deux époques glaciaires en Bourgogne. [Two glacial epochs in Burgundy.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 390–397.

Brings forward evidence to prove that Burgundy shows relics of two glacial epochs, the first in Miocene and the second in Quaternary times; the former characterized by the conglomerates with scratched pebbles of Dijon, by the clay with flints of the Chalonnais plain, and by the conglomerates and grit of the Gatinais and the Senonais. To the latter period belong the granitic sands, with rolled and angular blocks, of Autun &c., the *trainées* of boulders at all altitudes, and the detritic angular gravels which have been disintegrated from the subsoil on many of the plateaux and hill-sides without transportation. G. A. L.

——. Renseignements complémentaires sur l'époque glaciaire Miocène en Bourgogne. [Miocene glacial epoch in Burgundy.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 269–272, 1 fig. in text.

A reply to objections to the author's former paper, especially insisting on the probability of a period of cooling having occurred between the Eocene and Miocene periods. G. A. L.

Martins, Ch. Aigues-Mortes: son passé, son présent, son avenir. Essai géologique et historique. [Aigues-Mortes: its past, present, and future. Geological and historical essay.] 40 pp., map. Revue des Deux Mondes, Feb. 15, 1874.

——. Topographie géologique des environs d'Aigues-Mortes. [Geology of the neighbourhood of Aigues-Mortes.] Compt. Rend. t. lxxviii. pp. 1748–1750.

A letter discussing the deformation of the coast-line now going on at the western extremity of the delta of the Rhône. Since the foundation of Aigues-Mortes the sea has not retreated, and at that point the delta has not progressed; the increase of land which is taking place is owing to the deposit brought into the sea by the Petit Rhône, and driven by the littoral current, which is kept up by the south-east winds along the coasts of Provence and Languedoc; and these are forming a kind of natural breakwater. The amount of these deposits brought down has been calculated at four millions of cubic metres a year.

G. A. L.

Mercey, N. de. Géologie résumée du canton d'Amiens. [Geology of the canton of Amiens.] Bull. Soc. Lin. N. France, pp. 128, 146.

Meyn, —. [Jurassic rocks of Germany.] Zeit. deutsch. geol. Gesell. Bd. xxvi. pp. 355–362.

A letter on the occurrence of Jurassic rocks in North Germany, as indicated by boulders.

Moesch, C. Der südliche Aargauer-Jura und seine Umgebungen, enthalten auf dem Blatt viii. des Eidgenössischen Atlas. [Southern Aargau Jura and its surroundings, comprised in sheet viii. of the Federal Atlas.] 235 pp., 4 plates. 4to. Bern.

This forms the tenth number of the contributions towards a geological map of Switzerland, published by the 'Schweizerischen Naturforschenden Gesellschaft.' The plates consist of geological sections, and the text is a detailed explanation of the geology of the district. G. A. L.

Moffat, Dr. R. C. On the Bituminous deposits of the valley of the Pescara, South Italy. Chem. News, vol. xxx. no. 784, p. 255.

Calls attention to the commercial value of these deposits, which have been visited by the writer.

Mojsisovics, Dr. E. von. Ueber triadische Faciesgebilde in den Ost-Alpen. [Trias, Eastern Alps.] Verh. k.-k. geol. Reichs. p. 122.

——. Untersuchungen in der Umgebung der Seisser Alpe und von St. Cassian. [Researches in the neighbourhood of the Seisser Alp and St. Cassian.] Verh. k.-k. geol. Reichs. pp. 321, 322.

——. Abwehrende Bemerkungen zu Herrn Gümbel's neuester Schrift über das Kaisergebirge. [Remarks in refutation of Herr Gümbel's publication on the Kaisergebirge.] Verh. k.-k. geol. Reichs. pp. 329–334.

A controversial paper, defending the author's views as to the geology of the Eastern Alps against the strictures of Gümbel thereupon.

M[orris], J. The Old Rhine Valley. By Dr. Hibbert, F.R.S. Geol. Mag. dec. 2, vol. i. pp. 222, 223.

An account of the views on the history of the Valley of the Rhine, published in 1832, by Dr. Hibbert, in a work entitled "The History of the Basin of Neuwied." G. A. L.

Mourlon, Michel. Observations sur le classement des couches tertiaires moyennes dans le Limbourg Belge. [Classification of the Middle Tertiaries in Belgian Limburg.] Ann. Soc. Mal. Belg. t. viii. Mém. pp. 91–98.

A discussion of Messrs. Ortlieb and Dollfus's conclusions (see p. 87) with regard to Dumont's classification. The writer accepts in the main the views of the former. G. A. L.

——. Sur la nature des dépôts crétacés d'Anderlues. [Cretaceous deposits of Anderlues.] Ann. Soc. Mal. Belg. t. viii., Bull. des séances, pp. xcvi, xcvii.

Gives the palæontological characters of the Cretaceous beds met with in Pit No. 1 of the Viernoy colliery, in the Anderlues commune.

——. Sur l'assise Diestienne du Kiel près d'Anvers. [Diestian at

Kiel, near Antwerp.] Ann. Soc. Mal. Belg. t. viii., Bull. des séances, pp. cxxviii, cxxix.

Note of occurrence of the "Edeghem-sands" zone of the Diestian series.

Mourlon, M. Observations sur la position du Panisélien dans la série éocène à propos d'un travail récent de M. Ed. Hébert. [Position of the Paniselian in the Eocene series.] Proc.-verb. Soc. Mal. Belg. t. iii. pp. xxxiv–xxxviii.

Urges that the Paniselian should be kept in the Middle Eocene, since M. Hébert's palæontological grounds for merging it in the Ypresian in the Lower Eocene are doubtful. G. A. L.

——. Observations on M. Cogel's second paper on the *Terebratula-grandis* deposit near Antwerp. Proc.-verb. Soc. Mal. Belg. t. iii. pp. xlvi–lii.

Mineralogically this deposit differs from the underlying black Diestian sand. Palæontologically it contains a fauna much more Scaldisian than Diestian. The Terebratula-bed is therefore, in the author's opinion, the base of the Scaldisian (Pliocene), and gives the first junction yet observed in this district between this series and the Miocene Diestian. G. A. L.

——. Nouvelles observations au sujet de nos couches tertiaires à *Terebratula grandis.* [New observations on our *Terebratula-grandis* beds.] Proc.-verb. Soc. Mal. Belg. t. iii. pp. lvii–lix.

Continued criticism of M. Cogel's opinion as to the geological position of the green sands with *T. grandis* near Antwerp.

Nachten, J. Die Braunkohlen-Flötzverhältnisse bei Tüffer und Römersbad in Untersteiermark. [Stratigraphical Relations of the Brown coal at Tüffer and Römersbad in Untersteiermark.] Verh. k.-k. geol. Reichs. pp. 138–140.

Nathorst, A. G. Om en åsbildning vid Lilla Åby i Östergötland. [Åsar in Eastern Gothland.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 248–257, pl. xxv.

Divides the formation of the deposits into five stages:—1. The time of the first spreading of the ice to which the oldest glacial striæ belong, when the bottom moraine gravel filled up the lowlands. 2. A sinking of the land, with an accompanying shrinking back of the ice. Shore-deposits belong to this period. 3. The maximum sinking-point reached, when the glacial clays were terraced. 4. Rising of the land. This was the time of the denudation of the åsar, and of the deposition of sands and boulders. 5. A continued rising of the land to the present day. G. A. L.

——. Sandstenblock med *Paradoxides* anträffadt i Skåne. [Sandstone-boulder containing *Paradoxides* met with in Scania.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 271, 272.

Note of occurrence. Specimen now in the Lund Geological Museum.

Nathorst, A. G. Om Skånes nivåförändringar. [Changes of level of Scania.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 281-294.

Further proofs are given that a sinking no longer takes place in Scania, but that, on the contrary, this province shares in the general elevation of Scandinavia, and that the line of demarcation of this movement consequently runs to the south of Scania. E. E.

Naumann, Dr. C. F. Ueber die Hohburger Porphyrberge in Sachsen. [Hohburg Mountains, Saxony.] N. Jahrb. Heft iv. pp. 337-361, with map.

A description of the smooth, polished, and striated surfaces on the porphyry-rocks forming the Hohburg and other hills near Wurzen in Saxony, and a review of the causes which have been suggested to account for the formation of these surfaces, such as the action of blown sand and ice-action. Prof. Naumann's last memoir, left unfinished at his death. F. W. R.

Nivoit, —. Sur les phosphates de chaux de Ciply, en Belgique. [Phosphatic deposits of Ciply.] Compt. Rend. t. lxxix. pp. 256-259.

These deposits are in the Upper Chalk. They form a kind of conglomerate of brownish nodules, cemented in a calcareous paste and associated fragments of indurated chalk and fossils, the latter being sometimes rolled; the thickness varies, but rarely exceeds 1·5 metre. Several analyses are given. G. A. L.

Noguès, A. F. Les oscillations de la mer nummulitique. [Oscillations of the Nummulitic Sea.] Compt. Rend. 2 sess. Assoc. Franç. pp. 409-433.

After an account of the distribution of the various members of the Nummulitic series, the writer concludes:—1. That the lowest Nummulitic beds of India and of the Pyrenees seem to be anterior to the Suessonian beds of the Anglo-Parisian Basin. 2. That the lowest Nummulitic beds of the Adour Basin appear to be contemporaneous with the middle beds of the Pyrenæo-Mediterranean Basin; and that, moreover, the Adour Basin possesses a Nummulitic horizon of Tongrian age, This basin was dry land when the central Pyrenees, the Corbières, and India were covered by the waters of the great Lower Nummulitic lake. 3. That the Nummulitic beds of the Maritime Alps and of the Var are contemporaneous with those of the Central Pyrenees; but those of the Central Alps of Switzerland and Savoy seem to correspond to the Middle beds of the Pyrenees and to those of the Adour Basin. G. A. L.

Nordström, Th. Om förekomsten af siluriska lager i närheten af sjön Hjelmaren å hemmanen Björsholm och Öster Rynninge egor. [Silurian beds in the neighbourhood of the Hjelmaren Lake at the Björsholm farm and East Rynning.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 160, 161.

Note of occurrence.

Neumayr, Dr. M. Ueber den oberen Jura des Bas-Bugey (Süd-Frankreich). [Upper Jura of Bas-Bugey (South France).] Verh. k.-k. geol. Reichs. pp. 37–40.

Discusses some of the questions relating to the divisions of the Upper Jura, as illustrated by a memoir by M. Falsan on this formation at Bas-Bugey (Bull. Soc. Géol. France, 3 sér. i. p. 170). H. A. N.

Noth, Julius. Kleinere Mittheilungen. (1) Untersuchung auf Braunkohle bei Kapi, W., bei Eperjes im Sarosen Comitate Ungarns. (2) Kalkstein von Swiatkowa in der Herrschaft Miskowa bei Zmigrod in Galizien mit Drusen, welche Bergöl und Verdunstungsrückstände enthalten. (3) Graphit mit Schwefelkies und Brauneisenstein bei Dobschau, Gomöser Comitat, Ungarn. [Geological notes. (1) Investigation of the Brown Coal of Kapi, Hungary. (2) Limestone of Swiatkowa in Galicia, with druses containing petroleum and evaporation-residues. (3) Graphite, with pyrites and brown iron-ore, near Dobschau, Hungary]. Verh. k.-k. geol. Reichs. pp. 244–246.

Olszewski, St. Poglad na geologija a w szczegolnosci na formacyje mioceniczna wschodniej czesci Podola galicyjskiego." [Sketch of the Geology, and especially of the Miocene formation, of Eastern Podolia.] Akademija umiejetnosci w Krakowie [Ac. Sci. Cracow], pp. 212–252.

Omalius d'Halloy, J. B. J. d'. Note sur le terrain dévonien. Bull. Ac. roy. Belg. 2 sér. t. xxxvii. pp. 191–196.

Observations on Prof. Gosselet's paper on the Devonian rocks of the country between the Sambre and the Meuse (see p. 68).

Ortlieb, J. Falaise souterraine de la craie entre Roubaix et Tourcoing. [Underground Chalk-cliff between Roubaix and Tourcoing.] Ann. Géol. Nord, 1870–74, pp. 4, 5.

Note of an underground cliff 41 metres high, proved by borings between these two places.

——. Forages à Croix et à Roubaix. [Borings at Croix and Roubaix.] Ann. Soc. Géol. Nord, 1870–74, pp. 14, 15.

A section from the first place is given, 82·75 metres in depth, through the following beds, in descending order: Quaternary, Tertiary (Lower *Landenian*), White Chalk, Sandy Chalk, somewhat brecciated Chalk, Chalk Marl, Tourtia, Carboniferous Limestone. The Roubaix boring is mentioned for comparison only. G. A. L.

——. Considérations générales sur les terrains tertiaires inférieurs du bassin flamand. [Lower Tertiaries of the Flemish basin.] Ann. Soc. Géol. Nord, 1870–74, pp. 23–27.

The divisions recognized by the author are as follows, in ascending order:—Supercretaceous or Pretertiary Epoch, Epoch of the Clay of Flanders, Epoch of the Cassel Sands; Upper Eocene of Paris Basin wanting. By this arrangement the physical causes of deposition are shown. G. A. L.

Ortlieb, J. Remarques sur la carte géologique des environs de Roubaix, par M. G. Dollfus. [Remarks on the geological map of the neighbourhood of Roubaix, by M. G. Dollfus.] Ann. Soc. Géol. Nord, 1870–74, pp. 57, 58.

A novelty in this map is the representation by a special colour of a passage-zone which may be termed Middle Ypresian. What is represented in the map as Upper Landenian M. Ortlieb believes to be slightly lower beds between the Upper and Lower Landenian, the former of which he thinks is not to be found near Roubaix. G. A. L.

——. Compte-rendu d'une excursion à Cassel. [Excursion to Cassel.] Ann. Soc. Géol. Nord, 1870–74, pp. 101–109.

The geology of Mont Cassel and of the Mont des Récollets (with tabular section) is sketched. The following series are described in ascending order:—*Bruxellian Beds* (*Turritella-edita* beds; white unfossiliferous sands, sands with friable fossils, and bands with *Cardita planicostata*; *Nummulites-lævigata* sandstone); *Laeckenian Beds* (*Echinus* zone with *Terebratula Kickxi*; Zone of *Nummulites variolaria* and *Cerithium giganteum*; Sands; Glauconitic clay). G. A. L.

Ortlieb, J., and G. Dollfus. Compte-rendu de Géologie stratigraphique de l'excursion de la Société Malacologique de Belgique dans le Limbourg belge, Mai 1873. [Excursion in Belgian Limburg.] Ann. Soc. Mal. Belg. t. viii., Mém. pp. 39–57, 1 fig. in text and 1 plate.

After giving details of sections, the authors discuss the classification of the Limburg Tertiaries. They adopt a set of divisions similar to that proposed by Lyell, and different from Dumont's. The beds are equivalents of the U. and L. Rupelian and U. and L. Tongrian of Dumont; but the divisions of Lyell and of the authors do not correspond with them. The series is as follows, in descending order:—*U. and M. Oligocene* (of Beyrich): *Nucula* "tuffeau" (clay of Lyell); Bergh Sands; Sands of Vieux-Jonc; Marl of Henis. *L. Oligocene*: sands of Nurrepen and clay of Vliermael. G. A. L.

Palmgren L. Beskrifning till Kartbladet "Årsta." Sveriges geol. undersök. Pp. 43. [Description of Map No. 50, Swedish Geological Survey.]

——. Beskrifning till Kartbladet "Nynäs." Sveriges geol. undersök. Pp. 29, 3 woodcuts. [Description of Map No. 51, Swedish Geological Survey.]

Parker, James. The "Flint Implements in the Valley of the Somme." Journ. Vict. Inst. vol. viii. pp. 51–58, and abstract, under a different title, in Proc. Warwicksh. Nat. and Archæol. Field Club for 1873, pp. 14, 15.

Enters into the computation of the age and growth of the peat. Considers that the valley owes its origin "to operations connected with the rising from the ocean bed" and not "to the slow excavation of river action." W. W.

Paul, C. M. Die Braunkohlen-Ablagerungen von Croatien und Slavonien. [The Brown-coal deposits of Croatia and Sclavonia.] Jahrb. k.-k. geol. Reichs. Bd. xxiv. Heft 3, pp. 287–324.

The occurrences are grouped by age, and then by districts. First are given the coals of Aquitanian age (Oligocene or L. Miocene), or those below the "Leithakalk;" these are brown coals and better than the more recent ones. In Warasdin district 30 occurrences are described; the beds average from 3–5 feet. From other districts 8 are added. In the Sarmatic stage occurrences of coal are rarer. In the Congeria-beds the coals are lignites; of this age 23 occurrences are noted. Analyses are given, and the heating-power &c. of many of the coals are compared. E. B. T.

——. Zur Stellung der Radobojer Schichten. [Position of the deposits of Radoboj.] Verh. k.-k. geol. Reichs. pp. 223–225.

Adduces evidence that the deposits of Radoboj, containing remains of insects, are referable to the lower division of the Sarmatian Beds.

——. Die Trias in der Bukovina. [Trias in Bukovina.] Verh. k.-k. geol. Reichs. pp. 367–369.

Gives various stratigraphical and palæontological details regarding the Triassic deposits of the north-eastern portion of the Carpathians.

——. Vorlage der geologischer Detailkarte des Wassergebietes der Suczawa in der Bukovina. [Presentation of the Geological Map of the Water-region of Suczawa in the Bukovina.] Verh. k.-k. geol. Reichs. pp. 400, 401.

Peithner, Joseph. Ueber Braunkohlen-Vorkommnisse an der Oberen Gran bei Sielnice, Altsohl, N.W. [Brown Coal on the Upper Gran at Sielnice.] Verh. k.-k. geol. Reichs. pp. 334–336.

Péron, Alph. Sur quelques points de la géologie du département de Tarn-et-Garonne. [Geology of the Department of Tarn-et-Garonne.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 85-120, figs. in text.

A detailed description, with a discussion on the Permian rocks, which have been differently interpreted. The other formations described are L. Lias, Sequanian, Gypseous beds of Varen, and phosphatic deposits (L. Eocene). As a means of limiting the area within which the last may be searched for, the author states that all the district above 350 metres was never submerged in Tertiary times. The gypseous beds of Varen, which have hitherto figured as Trias, are Eocene. The Sequanian of La Rochelle is well represented in the department, where it had not been noticed previously. The Lower Lias is here, as in the Aveyron, composed in great part of magnesian rocks, and is almost without fossils. The Permian exists in the valley of the Céron; but the marine Zechstein, which M. Magnan described, does not exist, and its place is taken on the map by Lower Lias. G. A. L.

Pettersen, Karl. Om de inden Tromsö och Finmarkens Amter optrædende Bergslag. [Rocks of Tromsö and Finmark.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 274–280.

The rocks of these districts are described stratigraphically and lithologically, the chief divisions recognized being:—The Bottom rocks, consisting of typical gneiss and of micaceous and quartzose schists; the Tromsö mica-schist group, probably of Lower Cambrian age; the Balsfjorden schists, supposed to be of Upper Cambrian age; the Raipas series, which is probably the equivalent of the Hekla-Hook group of Spitzbergen (Silurian or Devonian); the Gaisa system of Dahll (= Upper Golda group of Pettersen). Among the igneous rocks are:—Gneiss Granite, Inland Granite, Gabbro and Hypersthenite, fine-grained Greenstone, Olivine rock passing to Serpentine, and Serpentine proper. G. A. L.

Pichler, A. [Note on the geology of the Gaflein, near Nasereit, in the Upper Inn valley.] N. Jahrb. Heft i. p. 61.

Piette, Ed. Note sur le Glacier quaternaire de la Garonne et sur l'âge du renne dans les grottes de Gourdan et de Lortet. [Quaternary Glacier of the Garonne, and age of the Reindeer in the caves of Gourdan and Lortet.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 498–519.

Describes the courses of the numerous ancient glaciers of the district and the moraine-deposits left by them. Ascribes the former alternating extension and retrogression of the Pyrenean glaciers to oscillations of the sea-level, which, by furnishing a greater or less surface for evaporation, furnished more or less humidity for the production of névé. The presence of a Saharan sea likewise influenced the size of these glaciers in this manner. The palæolithic deposits of the Gourdan cave are described, the more recent being characterized by reindeer-bones, and the older by those of the aurochs. The implements found are described. The contents of the Lortet cave are enumerated. From the evidence adduced, the author concludes that in reality the Reindeer age is that part of the Quaternary period during which the mountaineers of Southern France were addicted to sculpture and engraving; it was a calm long epoch, during which the glaciers, already retreating at its commencement, continued to melt away, and the great Quaternary animals disappeared one by one. G. A. L.

Platz, —. [On the Quaternary epoch of the history of the valley of the Rhine.] Verh. Nat. Ver. Carlsruhe, vi.

The origin of the Loess is ascribed to the disintegration of the Swiss Mollasse at the time of the melting of the great Alpine glaciers. The existence of Quaternary glaciers in the Vosges and in the Black Forest is thought doubtful. G. A. L.

Pošepný, F. Geologische Betrachtungen über die Gangspalten. [Geological considerations on fissure-veins.] Jahrb. k.-k. Bergakad. Leoben, &c. Bd. xxii. p. 233.

Pošepný, F. Die Blei- und Galmei-Erzlagerstätten von Raibl in Kärnten. [Lead- and Zinc-ore deposits of Raibl, Carinthia.] Jahrb. k.-k. geol. Reichs. Bd. xxiii. Heft iv. pp. 317–424, 3 plates.

The metalliferous limestone and dolomite of the Raibl district occurs below the Raibl shales. All the Plant and Fish remains of these beds have come from one locality; with them occur *Ammonites Aon* and *A. Archelaus*, *Halobia Lommeli*, &c. The metalliferous limestone contains scarcely any fossils, but is paralleled with the Hallstadt limestone. The nature of the Lead and Zinc deposits is described, and their genesis discussed, details concerning the impregnations of ore in the rock being illustrated by coloured lithographic facsimiles. These deposits are neither in beds nor in veins, yet they partake of the nature of both; they were evidently formed after the rock, and are of secondary origin; the deposits are frequently geodal with concentric layers of different ores. The ores have apparently been introduced into cavities and fissures dissolved out of the limestone, elimination of the calcareous matter and infiltration of the metallic minerals perhaps going on together. They are intimately connected with faults and joints, along which the dissolving waters have apparently moved and eaten away the rock irregularly. Analogous features in the deposits of lead and zinc ores in England and other countries are also noticed. E. B. T.

——. Die Eruptivgesteinsgänge von Mies in Böhmen. [Veins of eruptive rock at Mies, Bohemia.] Verh. k.-k. geol. Reichs. pp. 237–239.

Gives reasons for concluding that certain masses, which intersect the clay-slates of the neighbourhood, are trappean veins, instead of being sandstones, as some authorities have maintained. H. A. N.

Post, H. von. Kalkgranit funnen i Sverige. [Calciferous granite found in Sweden.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 3–7.

Note of occurrence in East-Gothland.

Quiquerez [A.]. [Notes on the caverns of the Bernese Jura.] Indicateur d'Antiquités Suisses, p. 512.

Radde, —. Vier Vorträge über den Kaukasus. [Four essays on the Caucasus.] 4to. 72 pp., 2 pl. Gotha.

Ramsay, Prof. A. C. The Physical History of the Valley of the Rhine. Quart. Journ. Geol. Soc. vol. xxx. pp. 81–93 (map and woodcuts).

Between Basel and Bingen there is a broad lake-like valley, mainly occupied by modern and old alluvia of the river, fringed by Miocene beds, which rise from beneath the alluvium, and lie against the older rocks—these last forming the hill-ranges of the district. Between Bingen and Rolandseck a narrow gorge is cut through the older rocks.

The author believes that during parts of the Miocene period the drainage of the broad valley was from north to south, into the area now occupied by the Miocene rocks of Switzerland. Subsequent disturbances reversed the drainage, and the Rhine flowed over an elevated plain of Miocene beds, the relics of which still exist. The gorge has been formed by gradual erosion; and the Miocene rocks have been in great part worn away, so as to leave the existing plain. W. T.

Ramsay, Prof. A. C. On the Physical History of the Rhine. Proc. Roy. Inst.

This lecture deals with the same subject as the foregoing paper, of which it is indeed a more popular version.

Raulin, **Victor**, and — **Jacquot**. Statistique géologique et agronomique du département des Landes. [Geological and agricultural statistics of the Landes.] Introduction and Part I. Mont-de-Marsan. 8vo, 270 pp., geological map.

This is not the geological part proper, which is to be published in 1875. The geological map is to a scale of 1: 200,000.

Reboux, —. Sur le diluvium rouge. [The Red Drift.] Compt. Rend. 2 sess. Assoc. Franç. pp. 383, 384.

Abstract. The author thinks that the residuum of the melting of the ice and snow which covered the north of Europe is the probable origin of the Red Drift which covers a large part of France and Belgium in a nearly constant thickness. G. A. L.

Redtenbacher, Dr. **Anton**. Ueber die Lagerungsverhältnisse der Gosaugebilde in der Gams bei Hieflau. [Cretaceous (Gosau) beds in the Gams valley.] Jahrb. k.-k. geol. Reichs. Bd. xxiv. Heft 1, pp. 1–6.

The succession of the Gosau beds in the Gams valley is not very clear, but seems to be the following, beginning at the base:—Conglomerate, Nerinæa-bed, Coal-bed (10 inches), containing freshwater shells; Sandstones, Actæonella-beds, Hippurite-limestone, Sandstones, Orbulite-beds. E. B. T.

Renevier, Prof. E. Tableau des terrains sédimentaires, avec leurs représentants en Suisse, et dans les régions classiques, leurs synonymes et les principaux fossiles de chaque étage. [Table of Sedimentary Rocks.] Bull. Soc. vaud. sci. nat. t. xiii. pp. 218–252.

The author divides the stratified beds into three main divisions as usual, viz. Palæozoic, Mesozoic, and Cænozoic. These he calls Eras, and remarks on the confusion which arises from the loose way in which the words era, period, epoch, system, formation, &c. are used. Following the botanists who use the words class, order, family, &c., always in the same order, he proposes a hierarchy of geological terms, as follows:—(1) *Era*, example, Mesozoic; (2) *Period*, e. g. Jurassic; (3) *Epoch* or *System*, e. g. Bathonian; (4) *Age* or *Stage* (étage), e. g. Bradfordian. It is suggested that these or similar words should, by a general convention, have a definite value given them, and be used always in the same order.

In one table the classifications used by different authors in the principal countries of Europe are collated. In the large diagram four columns are given to Switzerland, contrasting the beds of the Swiss Jura plain and Alps &c., while in five other parallel columns are contained the different facies of the stratified rocks in the chief countries of Europe. A separate column is devoted to palæontology. E. B. T.

Reul, X. de. Guide dans les collections préhistoriques des âges de la Pierre. Mus. Roy. Hist. Nat. Belg., pp. 94, 12mo: Brussels.

Popular Guide to the Prehistoric collections of the Brussels Museum, with a sketch of the climate of Belgium in Quaternary times, and descriptions of the chief bone-caves of the country. G. A. L.

Richardson, Ralph. Notes on the Dutch Peat Industry. (Abstract.) Trans. Edin. Geol. Soc. vol. ii. part iii. pp. 276–282.

There are three kinds of peat found in Holland:—1. "Lange turf," commonly called "Friesche turf," is surface-peat, and comes from the "high fens." 2. "Korte turf" is in the form of paste or mud saturated with water, and is got by dredging from the "low fens" or bogs covered with water. 3. "Derric turf," a layer of peat found under the sand-dunes of the coast of Holland, which has been compressed by the overlying sand. The last is comparatively rare, but is used as fuel. No. 2 is superior for fuel to No. 1. G. A. L.

Richthofen, — von. Ueber Mendola-Dolomit und Schlern-Dolomit. Zeit. deutsch. geol. Gesell. Bd. xxvi. Heft 2, pp. 225–256.

In the Trias of South Tyrol dolomites occur at two horizons. The upper series is the "Schlern Dolomite," and the lower the "Mendola Dolomite." The author defends his theory that the Schlern Dolomite represents ancient coral-reefs, and in support records observations on a raised coral-reef on the southern coast of Java. He also describes the beds below the Mendola dolomite. F. W. R.

Robert, E. Considérations géologiques sur l'origine probable du terrain de transport dit *diluvien*. [Origin of Diluvium.] Compt. Rend. t. lxxviii. pp. 955–957.

Attributes the Drift of Western Europe to the sudden disappearance by overflow of vast lakes caused by upheaval of great mountain-chains.

——. De la faible influence qu'ont exercée les eaux diluviennes sur la formation des vallées du bassin de Paris. [The small influence of diluvial waters in the formation of the valleys of the Paris Basin.] Compt. Rend. t. lxxix. p. 817 (abstract).

Since the disappearance of the lakes of the Paris Basin its valleys have not deepened or enlarged, but the contrary is the case.

Robert, Félix. Volcans de la Haute-Loire. [Volcanoes of the Haute-Loire.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 245–250.

The old volcanoes described belong to the phonolitic or older and to the trachytic or newer group. Those of the first age are Fay-le-froid, Le Signon, Le Mézenc, l'Ambre, Tourte; those of the second are Les Dents de Mézenc, Rofiac, Le Mégal, Queyrières, Volcanoes of the Pertuis (including Mont Gros, Mont Estion, and Mont Grand-

Court), Volcanoes of Mézères (including Mont Vaux, La Planèze, Mont Archer, Jalore, Gerbison), Miaune, and La Madelaine. G. A. L.

Roemer, F. Ueber die ältesten versteinerungsführenden Schichten in dem Rheinisch-Westfälischen Schiefergebirge. [Oldest fossiliferous beds of the Rhenish-Westphalian slates.] Zeit. deutsch. geol. Gesell. Bd. xxvi. pp. 752–760.

It has been generally considered that the oldest member of the Palæozoic rocks forming the hilly land on both sides of the Rhine is the "Coblentz grauwacke." The author shows that at Greiffenstein, near Herbom, in Nassau, this series of beds is underlain by others containing white quartzites, characterized by the occurrence of a large *Pentamerus* (*P. rhenanus*). He also believes that the Greiffenstein quartzite is older than the Wissenbach slates, these in turn being older than the Coblentz grauwacke. F. W. R.

Roemer, H. Neue Aufschlüsse oligocäner Schichten in der Provinz Hannover. Zeits. deutsch. geol. Gesell. Bd. xxv. Heft 2, pp. 342–344.

Notice of three new localities of Oligocene beds in Hanover:—Middle Oligocene clay, N. of Lehrte; Upper Oligocene fossiliferous deposit, near the Ilseder Hütte, Peine; Upper Oligocene fossiliferous beds at Wehmingen, south of Lehrte. F. W. R.

——. Ein neuer Aufschluss der Wäldthon- und Hilsthon-Bildung. Zeits. deutsch. geol. Gesell. Bd. xxv. Heft 2, pp. 345–348.

Note on the occurrence of Weald Clay and Hils Clay in the neighbourhood of Sehnde, in Hanover. A woodcut shows the beds passed through in sinking a shaft for working brown coal. It appears to be on the southern margin of a great basin of Weald Clay. F. W. R.

——. Ueber ein neues Vorkommen des Räth bei Hildesheim. Zeits. deutsch. geol. Gesell. Bd. xxv. Heft 2, pp. 349–354.

A record of the discovery of Rhætic Beds at the "Krählah," near Hildesheim. The author gives a detailed section, and notes the fossils.

Roys, le Marquis de. Observations sur les communications de M. de Saporta. [On M. de Saporta's communications.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 173–176.

Describes stratigraphically the Pliocene clays of the neighbourhood of Théziers and Domasan, where M. de Saporta collected the fossils described by him in several papers. G. A. L.

Rücher, A. Einiges über Mies in Böhmen. [Geology of Mies in Bohemia.] Verh. k.-k. geol. Reichs. pp. 60–62.

Rutot, A. Rapport au point de vue paléontologique de l'excursion entreprise les 18 et 19 Août, 1873, aux environs de Tongres par les membres de la Société malacologique de Belgique. [Palæontological Report of Excursion in the neighbourhood of Tongres.] Ann. Soc. Mal. Belg. t. viii. Mém. pp. 58–69.

Lists of the fossils found during the excursion are given. The beds examined were the following :—*Lower Rupelian* (Nucula Clay, marine; White Sand, marine and brackish; Whitish Sand, brackish and freshwater); *Upper Tongrian* (Henis Clay, fluvio-marine; Yellowish-white Sand, fluvio-marine; Greyish-white Sand); re-assorted bed with *Ostrea* and fish-teeth; *Lower Tongrian* (Green sands, marine). G. A. L.

Rutot, A. Note sur une coupe des environs de Bruxelles. [Section near Brussels.] Ann. Soc. Géol. Belg. t. i. Mém. pp. 45–59, pl. ii.

A detailed account of an exposure of *Bruxellian* and Upper *Ypresian* beds at St. Josse-ten-Noode. Six subdivisions are recognized, among which are two of the Bruxellian which were hitherto little known—No. 4, calcareous sands with broken fish-teeth and shells, and an intercalated very calcareous band in no. 3. No. 5 in the section is shown to be the parent bed of the famous fruits of *Nipadites Burtini*, which is thus shown to be *Bruxellian* and not *Laeckenian*, as has been supposed. G. A. L.

Salino, Fr. Il gruppo delle Isole Eolie. [The Eolian Islands.] Boll. R. Com. geol. Ital. pp. 159-163.

An extract from the Italian Alpine Club 'Bollettino' (viii. 1874). Gives heights of Lipari, Stromboli, and the other islands, with topographical notes on their craters. Of thirteen islands only seven are inhabited. The craters are mostly formed of pumice, with blocks of obsidian, with some trachytes and lavas. In Filicuri alternations of lava and tuffs are seen. E. B. T.

Sandberger, F. The Upper Rhine Valley in Tertiary and Diluvial Times. Geol. Mag. dec. 2, vol. i. pp. 215–221.

A translation, by Mrs. A. C. Ramsay, from the original paper in 'Das Ausland,' no. 50 (1873).

Schiötz, O. E. Beretning om nogle Undersögelser over Sparagmit-Koarts Fjeldet i den ostlige Del af Hamar Stift. [Sparagmite-Quartz district, in the Eastern part of Hamar Stift (Norway)]. Nyt Magazin for Naturvidenskaberne, Bind xx. Förste Hefte, Kristiania.

Schlüter, Clemens. Der Emscher Mergel. [Ems Marl.] Zeit. deutsch. geol. Gesell. Bd. xxvi. pp. 775–782.

Preliminary notice of a thick deposit above the *Cuvieri*-Pläner and below the Quadrat-chalk. It has been known as Grey Marl and as Stoppenberg Marl; but as it is typically developed in the valley of the Ems in Westphalia, the author proposes to distinguish it as "Ems Marl." F. W. R.

Schneider, O. Ueber die geognostischen und mineralogischen Verhältnisse der Insel Elba. [Geology and mineralogy of Elba.] Isis, Dresden (Sitzungsb.), p. 2.

A summary of the mineral resources of the island.

Schnetzler, J. B. Notice géologique et minéralogique. Bull. Soc. Vaud. Sci. Nat. t. xii. no. 71, pp. 438, 439.

Notices, in the valley of the Sarine near Rossinières (Switzerland), limestones with lignitic matter and fossils, and veins of quartz-crystals whose black colour is supposed to be due to their being formed in the wet way in contact with organic matter. Notices also near Vallorbes crystals of arragonite interlacing and forming among vegetable matters, mycelium of fungi, &c. E. B. T.

Seguenza, G. Studii stratigrafici sulla Formazione pliocenica dell' Italia Meridionale. [Stratigraphical studies on the Pliocene formation of S. Italy.] Boll. R. Com. geol. Ital. pp. 1–15, 67–85, 146–152, 271–283, & 331–347.

A continuation of the Catalogue of Mollusks and Cirripedes from the upper zone of the Pliocene of Southern Italy. There are four columns for Sicilian localities, five for Calabrian, two for Tuscan; and further two columns are set apart for noting whether any species survives to the Recent period, and is found in the Mediterranean or Northern seas. Former parts appeared in the 'Bollettino' last year (see also *post*). E. B. T.

——. Nota sulla "relazione di un viaggio geologico in Italia" del Dott. Fuchs. [On a paper by Dr. Fuchs concerning a geological journey in Italy.] Boll. R. Com. geol. Ital. pp. 294–306.

Dissents from views expressed by Dr. Fuchs, who has referred the Miocene limestone of Castellina and Rosignano to the age of the Leitha conglomerate, and identified it with the "concretionary limestone" of Seguenza. The author refers the Rosignano limestone to the period between Upper and Middle Miocene, and the "lenticular rock" of Parlascio he places between Upper Miocene and Older Pliocene; the concretionary limestone occupies different levels towards the lower part of the Pliocene. He divides the Pliocene into two zones, unconformable to each other. E. B. T.

——. [Sicily.] Zeit. deutsch. geol. Gesell. Bd. xxvi. Heft 4, pp. 934, 935.

Letter announcing the formation of the nucleus of a Geological Museum at Messina, and referring to the writer's recent researches on the older Tertiary and the Cretaceous rocks of Sicily. F. W. R.

Sexe, S. A. Jættegryder og gamle Strandlinier i fast Klippe. [Giants' Cauldrons, &c.] Pp. 44 (3 plates, woodcuts). 4to. Kristiania.

Describes several "giants' cauldrons" in Norway, discusses the theories of their origin, and suggests that they may have been formed by the friction of sand, gravel, and stones rotated by a moving column of ice. This paper is accompanied by an English translation; the essay on old coast-lines is not translated. F. W. R.

Sidenbladh, M. Om siluriska bildningar i Lappland. [Silurian deposits, Lapland.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 88–96.

Consists of a number of local details as to the lie of the Silurian beds.

Sjögren, A. Om några försteningar i Ölands kambriska lager. [Fossils from the Cambrian beds of Öland.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 67–80, pl. v.

The literature of the subject is given. The beds from which the fossils have been obtained are described; they consist of sandstone, shaly sandstone, and gypsiferous clay-slates. The fossils are enumerated, and, to some extent, described; they are:—6 species of *Paradoxides*, of which four are undetermined, one of the others being *P. Oelandicus*, n. sp. (fig. 1); *Ellipsocephalus*, sp. indet.; *Agnostus regius*, n. sp. (fig. 6), *A.* sp. indet.; and two undetermined species of *Theca*. Comparing the series with the Cambrian of other countries, the author refers the sandstone to "Etage Azoïque B" of Barrande and to the Longmynd of Britain, the shaly sandstone and clay-slates together to the "Faune primordiale" and to the Menevian, while the alum-shales with *Oleni* represent the Saknas of Bohemia and the Lingula-flags of England. G. A. L.

——. Exempel på gångformigt uppträdande hälleflinta. [Instance of Hälleflinta occurring as a dyke.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 86–88, 1 fig. in text.

Note of a mass of compact hälleflinta cutting off some nearly vertical beds of banded limestone at the South Silfberg mine in Dannemora. G. A. L.

——. Anteckningar från en resa i Ångermanland och Jemtland sommaren 1871. [Journey in Angermanland and Jemtland.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 115–118.

Notes, chiefly on the sequence of the beds of the Tåsjö mountains.

——. En geologisk profil inom norra delen af Svartelfvens floddal. [Geological section in the northern part of the Svartelfven valley.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 147–151, pl. xiv.

The section shows felsitic conglomerates, sandstone, coarse grit, and greenstone interbedded with felstones, all having a high dip to the S.W. G. A. L.

——. Om sambandet mellan det sätt, hvarpå våra malmer uppträda, och den relativa åldern hos de bergarter, hvaruti malmerna förekomma. [The connexion between the manner in which ores appear and the relative ages of the rocks in which they are found.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 2–13.

It is now generally accepted that the ores of Sweden form beds or ellipsoidal masses (lagerstockar), and cannot be classed as veins. The author arranges the Swedish iron-ores under the following heads—Quartzose and felspathic ores, pyroxenic and hornblendic ores, manganesian and calcareous ores.

The ores of the first group are characterized by their striated appearance, by the percentage of quartz and felspar, by the presence of phosphorus in a greater or less degree (possibly owing to the felspar), by a total absence of minerals belonging to the augite or hornblende types, and by limestone beds. Apatite is occasionally present. These ores, which are seldom found in large quantities, consist of magnetite and hæmatite.

The ores of the second group consist of magnetite, and are found together with malacolite, coccolite, hornblende, asbestos, talc, chlorite, garnet, serpentine, epidote, or other varieties connected with these minerals. They are often richer, purer, and more ductile than the others, contain but little phosphorus, and are usually fused without the aid of fluxes, yielding a good and strong iron.

The ores of the third group are principally distinguished by their manganiferous and calcareous character and the large quantity of *sulphurous metals* which they often contain. Among the associated manganitic minerals, the following chiefly occur:—Hausmannite, rhodonite, manganese-spar, and knebelite. As a rule, these are magnetic iron-ores.

In the author's opinion, these groups belong to different geological ages in the order above given, from the older to the newer—the first group occurring in connexion with pure gneisses, and the two others with euritic and felsitic rocks (Hälleflinta). E. E.

Sjögren, A. Anteckningar i praktisk geognosi. II. Några observationer vid Dannemora mellanfält. [Suggestions in practical geology. Some observations in Central Dannemora.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 27–33, pl. iii.

A practical paper on the proper mode of indicating geological details on mining-plans, illustrated by an application of the author's rules to the mining-district of the Central Dannemora Plain, of which a plan, showing the distribution of the ore and of the country-rock, together with the workings &c., is given.

Stache, Dr. Guido. (1) Ueber eine Vertretung der Perm-Formation (Dyas) von Nebraska in den Süd-Alpen. (2) Neue Fusulinen-Fünde in den Karawanken. (3) Wahrscheinliche Aequivalente der oberen Dyas in den Central-Alpen. [1. Representatives of the Permian of Nebraska in the Southern Alps. 2. New discoveries of *Fusulina* in the Karawanke Mountains. 3. Probable equivalents of the Upper Permian in the Central Alps.] Verh. k.-k. geol. Reichs. pp. 87–90.

The most important point developed is the close relation between certain of the Permian deposits of the Alps and the same formation as exhibited in Nebraska, U. S. H. A. N,

——. Vertretung der Perm-Formation in den Süd-Alpen. [Representation of the Permian in the Southern Alps.] Verh. k.-k. geol. Reichs. pp. 365–367.

Gives additional details as to the occurrence of Permian deposits in the Southern Alps, and the organic remains which they contain.

——. Die palæozoïschen Gebiete der Ostalpen. No. 2. [Palæozoic districts of the E. Alps.] Jahrb. k.-k. geol. Reichs. Bd. xxiv. Heft 2, pp. 135–274, geological map and 2 plates of sections.

In the author's words, this paper is an attempt at a critical exposition of the state of our knowledge of the constitution of the pre-Triassic rocks in the Austrian Alps. The pre-Triassic rocks are divided into five groups: the first three are inner Alpine; the last two occur mostly on the borders: they are termed:—1. Quartz phyllites, or mica-schists with quartz, a little limestone, &c.; 2. Calcareous shales [*Kalkphyllitgruppe*], hornblende, and mica-schists with talcose limestones; 3. Calcareo-argillaceous phyllites [*Kalkthonphyllitgruppe*], dolomites, laminated limestones and shales, chlorite-slate, &c.; 4. Older greywacke, *i. e.* L. and U. Silurian, Devonian; 5. Carboniferous and Permian. All these are separately laid down on the map. In the second part of the paper the Southern Alps are especially treated of, and a review is given of all that has been written about the district. The fresh observations throw further light on the complex structure of these Alps. *Fusulinæ* were found abundantly in both Permian and Carboniferous; many new species are cited (to be shortly described): there is said to be an insensible gradation between these two formations; both Lower Carboniferous (Culm) beds and Upper are recognized with coal-plants. Upper Silurian is noted; but it is not attempted to refer lower beds, which have yielded no fossils, to Cambrian or Taconic systems as some others have done. E. B. T.

STACHE, Dr. GUIDO. Die palæozoïschen Gebiete der Ostalpen (zweite Folge). Südalpine Gebiete: westliche oder cadorische Flanke. [Palæozoic districts of the E. Alps. Southern districts, western or Cadoric flank.] Jahrb. k.-k. geol. Reichs. Bd. xxiv. Heft 4, pp. 334–423.

This is the second part of a treatise entitled "An attempt at a Critical Exposition of the state of our knowledge of the Structure of pre-Triassic Rock-masses in the Austrian Alpine districts." The ground covered by the present essay includes the Brixen, the Cima-d'Asta, Adamello, and Valtelina districts. The relations of the southern zone are much less plain than the northern flank: no Silurian fossils have been found to fix the age of any greywacke; so that the grouping of micaceous, quartzose, argillaceous, and calcareous schists must be based on lithological characters. The author has before divided the crystalline schists into four groups, of which the oldest is gneissic schists (Gneissphyllitgruppe): this is not found with any certainty in its usual development; but the Cima-d'Asta granite is supposed to be of this age, for it is older than the argillo-micaceous schists which dip towards it. Group 2. Quartz-schist (Quartzphyllitgruppe) of typical character occurs, but the limestones cannot be separated from those of the next group (Kalkthonphyllitgruppe). Some of the limestones have the appearance of Silurian; but no traces of fossils are usually seen. Near Recoaro are crinoidal fragments, which give an Upper Silurian appearance. Though no Carboniferous fossils have been found, certain conglomerates in the Pusterthal district are supposed to be of this age. The South-Tyrol porphyries and tuffs belong to the Permian.

In the chapter on tectonic or structural relations, the Pusterthal quartz-schist group is said to be essentially a system of several leading faults with an E.–W. direction and an inclination S. of 80°–45°; bringing into their midst sometimes older masses (gneiss or mica-schists), sometimes newer beds of the greywacke type (Kalkthonphyllitgruppe). A complete digest of the literature of the subject is added. E. B. T.

Stark, F. Die Bayerischen Seen und die alten Moränen. [Bavarian Lakes and old Moraines.] Large folio map, with text. Munich.

Stefani, Carlo de. Gli antichi ghiacciai dell' Alpe di Corfino, ed altri dell' Apennino settentrionale e delle Alpi Apuane. [Ancient glaciers of Mt. Corfino and others of the Northern Apennines and Apuan Alps.] Boll. R. Com. geol. Ital. pp. 86–94.

Moraine-deposits were found in the valley of the Sauro, between Modena and Castelnuovo; the rock from which the boulders were derived was found in place at the Corfino Alp (Apennines), at about 4700 feet. Similar moraines are noticed in other valleys of the Apennines, and also in the Apuan Alps. E. B. T.

——. Considerazioni stratigrafiche sopra le roccie più antiche delle Alpi Apuane e del Monte Pisano. [Stratigraphical considerations on the more ancient rocks of the Apuan Alps and Monte Pisano.] Boll. R. Com. geol. Ital. pp. 131–145, 195–216, 259–270, 348–361, plate of sections.

Deep valleys intersect these mountains, and display their dome-shaped structure; the lowest beds seen are ochrey limestones 3–4 metres thick; above are crystalline schists disposed round the central nucleus; these schists include protoginic gneiss, quartzites, &c.; the major axis of the elliptical dome lies N.N.E. and S.S.W. Above, and conformable to, these schists comes the Carrara-marble series; and then follow schists and flags again, which form the outer ring, being above the marble series. The fossils found in the marble are imperfect specimens of *Chemnitzia* &c.; they may be Triassic, but the age is still doubtful; they are, however, certainly older than Rhætic.

In the Monte-Pisano district the upper schists form the central nucleus, contrary to what occurs in the Apuan Alps, and the axis lies N.W. by S.E. Above these upper schists are grey limestones, frequently with fossils, and identical with the Spezia beds of Infra-Liassic age; they form a continuous circle on the outer flanks of both districts; this rock is frequently cavernous or dolomitized, and in this case was by previous observers generally classed as Triassic. E. B. T.

Stöhr, E. [Sicily.] N. Jahrb. Heft 2, pp. 169–171.

Letter correcting some statements in Prof. Vom Rath's 'Ausflüge nach den Schwefelgruben von Girgenti,' and adding some notes on the geology of Girgenti, with statistics of the sulphur-production. F. W. R.

Stokes, Arthur H. Notes on the Coal Seam and Geology of Suderöe. Trans. Chesterfield and Derby Inst. of Eng. vol. ii. part viii. pp. 320–335, plates xxxvii.-xl. (maps, sketch, section, rocks).

The island, the most southern of the Faroe group, is mountainous and precipitous, and consists of beds of trap, basalt, and dolerite. The coal-bearing beds, which are in the midst of the trap, may be 50 feet thick; the seams are thin; and it is estimated that there may be fourteen millions of tons in the small coal-field. Parts of the coal have been altered by the trap, the beds of which appeared moulded upon each other, as if one had hardened before the next flowed over it; and it is concluded that the coal was deposited in an interval between submarine eruptions. Analyses of 3 coals are given, and the minerals and rocks of the island are noticed. W. W.

Stolpe, M. Om Siljanstraktens sandstenar. [Sandstones of the Siljan district.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 17–28, pl. ii.

Gives a number of observations respecting the order of stratification in the neighbourhood of the Siljan lake (Dalecarlia). A geological map is given, in which the following divisions are distinguished:—*Leptæna* limestone, sandstones, and upper graptolite-schists. 2. *Trinucleus* schists, *Chasmops* limestone, and *Orthoceras* limestone. 3. Diegerberg sandstone. 4. Porphyry and Eurite-grits (Felsites). 5. Granite. 6. Hyperite (Gabbro and Hypersthenite). G. A. L.

——. Beskrifning till Kartbladet "Bjorksund." Sveriges geol. undersök. [Description of map No. 53, Swedish Geological Survey.] Pp. 15.

Studer, B. Geologisches von Aargletscher. [Geology of the Aar Glacier.] 12mo. 5 pp., 1 plate. Berne.

——. On the junction of the granite and crystalline schists on the left bank of the Aar-glacier. Mittheil. naturf. Gesell. Bern.

The granite is shown to be the newer of the two.

——. Die Gotthard-Bahn. [The St. Gothard Railway.] Petermann's Mittheilungen, Bd. xx. pp. 339–343.

Lecture to the Nat.-Hist. Soc. of Berne. The points of geological interest in piercing the tunnel are discussed.

Stur, D. Momentaner Stand meiner Untersuchungen über die ausseralpinen Ablagerungen der Steinkohlenformation und des Rothliegendes in Oesterreich. [Present condition of my researches on the Extra-Alpine deposits of the Carboniferous formation and Rothliegende in Austria.] Verh. k.-k. geol. Reichs. pp. 189–209.

A full account of the characters and divisions of the Carboniferous formation and Rothliegende of Austria, outside the Alps, as known to the author. The stratigraphical portion of this investigation is not finally completed, and it will be followed by an examination of the plant-remains found in the deposits in question. H. A. N.

Stur, D. Ueber das Niveau der in der Umgegend von Rakonitz abgebauten Flötze. [Horizon of the worked-out seams in the neighbourhood of Rakonitz.] Verh. k.-k. geol. Reichs. p. 267.

——. Neue Aufschlüsse im Lunzer Sandstein bei Lunz, und ein neuer Fundort von Wenger-Schiefer im Pölzberg zwischen Lunzersee und Gaming. [New exposures of the Lunz Sandstone at Lunz, and a new locality for the Wenger beds in Pölzberg between the Lunzer See and Gaming.] Verh. k.-k. geol. Reichs. pp. 271–273.

——. Neue Aufschlüsse in Seegengottes bei Rossitz, und Sendung von Pflanzenresten aus dem liegendsten Flötze von Herrn H. Rittler. [New exposures in Seegengottes, near Rossitz, and a collection of plant-remains from the lowest beds, by Herr H. Rittler.] Verh. k.-k. geol. Reichs. pp. 396–399.

Taramelli, T. Stratigrafia delle serie paleozoica nelle Alpi Carniche. [Stratigraphy of the Palæozoic Series of the Carnic Alps.] Memorie del R. Istituto Veneto, vol. xviii.

Tardy, A. Sur des traces de glaciers quaternaires dans les montagnes de la Madelaine. [Traces of Quaternary glaciers in the Madelaine hills.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 414, 415.

Announces discoveries of striated boulders of Carboniferous conglomerate.

——. Age, Origine, Climat des Glaciers Miocènes. [Age, origin, and climate of the Miocene glaciers.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 453–457.

Suggests the correlation of the Miocene deposits of the Turin hill (believed by Gastaldi and by himself to be glacial) with the *Helix-Ramondi* conglomerate of Dijon (believed by M. Martin to be of glacial origin), and with the sands and conglomerates of the forest of Orleans. The climate of the period is compared to that of New Zealand.
G. A. L.

——. Coupe de la Bresse, à propos de la communication de M. de Saporta sur les tufs de Meximieux. [Section across the Bresse, with reference to M. de Saporta's communication on the tuffs of Meximieux.] Compt. Rend. 2 sess. Assoc. Franç. pp. 382, 383.

Subdivides the divisions E and C of M. Benoît [Bull. Soc. Géol. France, t. xv.] into several zones. G. A. L.

Tombeck, —. Note sur l'Oxfordien et le Corallien de la Haute Marne. [Oxfordian and Corallian of the Haute Marne.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 13–21, 1 fig. in text.

This paper refers to part of a fine section between Villiers-sur-Marne and Roocourt. The following divisions are determined:—1. *Astarte* Limestone. 2. Oolite of La Mothe. 3. Upper compact Coralline Oolite. 4. Oolite of Soncourt. 5. Lower compact Coralline Oolite. 6. Upper marl without fossils. 7. Oolite with Dicerates, and lumpy limestone with *Hemicidaris crenularis*. 8. Lower marl without fossils. 9. Zone of *Ammonites hispidus*. 10. Zone of *Am. Babeamus* and *Am. arolicus*. 11. Zone of *Am. Martelli* and *Am. polyplocus*. From 1 to 8 belong to the Corallian, the rest to the upper part of the Oxfordian.

G. A. L.

Tombeck, —. Note sur une excursion géologique faite au travers des terrains Coralliens et Oxfordiens de la Haute-Marne. [Excursion through the Corallian and the Oxfordian of the Haute-Marne.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 251–255.

The following table gives the views of the author as to the lower divisions of the Coralline Oolite in the valleys of the Aube, the Marne, and the Rognon :—

Aube.	Soncourt.	Bologne.		Rognon.	
Marls without fossils, and lithographic Limestones.	Upper Marls without fossils.	Oolite with Dicerates.	Lower Marls without fossils.	Oolite with Dicerates.	White Oolite.
	Rubbly Limestone with *Cidaris florigemma*.		Limestone with *C. florigemma*.	Rubbly Limestone.	Coral Limestone.
	Lower Marls without fossils.		Lower Marls without fossils.		Rubbly Marls with *C. florigemma*.

Oxfordian.

G. A. L.

Tordeux, —. Grès à *Num. lævigata*, à Glageon. [*Num.-lævigata* grit at Glageon.] Ann. Soc. Géol. Nord, 1870–74, p. 41.

Note of occurrence.

Törnebohm, A. E. Några geognostiska iakttagelser i trakten af Mjösen. [Geological observations in the Mjösen district.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 9–14, pl. i.

The divisions recognized are the following:—1. Lower Silurian sandstones and shales, and alum-shales with swinestone. 2. Green schists with *Paradoxides Kjerulfii*, and quartzite and conglomerate. 3. Sandy limestone, and schists with calcareous bands. 4. Dark clay-slate, sometimes taking the form of alum-shales. 5. Gneiss. Five longitudinal sections are given.

G. A. L.

——. Om förekomsten af serpentin i Jemtland. [Serpentine in Jemtland.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 29, 30.

Note of occurrence.

——. Några anteckningar om Sveriges urterritorium. [Primitive rocks of Sweden.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 175–187, 194–201, pl. xvii. A German version in N. Jahrb. Heft 2, pp. 131–146, with plate.

Classes the schistose rocks of Sweden under the following heads:—*Jerngneis* (Iron-gneiss), containing neither limestone nor ores. *Grå gneis* (grey gneiss), containing limestone, but only in its upper parts. *Röd gneis* (Red gneiss), containing both limestone and ores. *Eurit* with Oligoclase-gneiss, containing thick layers of limestone and ores, principally in the lower parts of the division. *Lerskiffer* (Clay-slate) and green Eurite, &c., containing ores and limestone in its lower parts. E. E.

TÖRNQUIST, S. L. Om Siljanstraktens palæozoiska formationsted. [Palæozoic formations in the neighbourhood of Lake Siljan, Dalecarlia.] Öfver. K. S. Vet. Akad. Förhandl. no. 4.

TOUCAS, A. Note sur la géologie des environs de Toulon. [Geology of the neighbourhood of Toulon.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 457–463, 1 fig.

Gives the relations existing between the Jurassic and Cretaceous deposits to the north of Toulon, a detailed section of the Caoumé hill, and short lists of fossils. G. A. L.

TOULA, FRANZ. Die Congerienschichten an Eichkogel bei Mödling. ["Congeria-beds" at Eichkogel.] Verh. k.-k. geol. Reichs. p. 383.

TOURNOUËR, R. Note sur les coquilles des tufs quaternaires de la Celle, près Moret (Seine-et-Marne). [Shells of the Quaternary tuffs of the Celle, near Moret.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 443–452.

Gives a list of the species found. Of these, 21 are still living in the district; 5 are still living in France, but not in this district; 3 are still living in Europe, but not in France; 4 (or perhaps 8) are extinct. The age of these tufaceous deposits the writer considers to be that of *Elephas primigenius* and *Rhinoceros tichorhinus*. G. A. L.

TRAUTSCHOLD, —. Ueber die Naphtaquellen von Baku. [Naphtha-springs of Baku.] Zeits. deutsch. geol. Gesell. Bd. xxvi. pp. 257–274, pl. iv.

Describes part of the peninsula of Apscheron. A map (not geological) is given, showing the distribution of the springs of inflammable gas, the mud-volcanos, and the naphtha-springs. Four kinds of springs are recognized—those of naphtha, of gaseous hydrocarbons, of salt water, and of fresh water. The naphtha generally occurs in sands and sandstones of younger Tertiary age. During the excavation of a reservoir in the naphtha-bearing sand the author found shells of *Cardium trigonoides* and *Mytilus polymorphus*. A peculiarly limpid naphtha occurs on the margin of a salt-lake near Ssurachany; and a clay in this locality has yielded the following fossils:—*Monodacna caspia*, *M. intermedia*, *Didacna trigonoides*, and *Congeria rostriformis*. The paper contains statistics of the production of naphtha, and a description of the chemical operations of the petroleum-works. F. W. R.

TRIBOLET, M. F. DE. Notes géologiques et paléontologiques sur le Jura Neuchâtelois. [Geological and Palæontological Notes on the Neuchatelese Jura.] Pp. 32, plate (section and fossils). Published with Bull. Soc. Sci. Nat. Neuchâtel, t. x. 1 cahier.

1. On the presence of hydraulic limestones in the "Lower Astartian" (pp. 5–8). 2. On a supposed bed of "Upper Corallian" at Joux-derrières (pp. 9–14), with section and list of fossils. 3. On the fossiliferous

bed of "Upper Astartian" of Crozot (pp. 15–32). This contains a list of 115 species of fossils, with their range and some remarks, including a description of the following new species:—*Tornatella submyosotis*, *Lima Heimi*, and *Amorphospongia Crozotensis*. W. W.

Vanden Broeck, Ernest. Extrait d'un rapport sur une excursion faite le 16 Juillet 1874 au Bolderberg près de Hasselt. [Excursion to the Bolderberg.] Proc.-verb. Soc. Mal. Belg. t. iii. pp. clxxv–clxxxiv.

The Bolderberg hill is formed of the following beds, in ascending order:—Rupelian Clay (Middle Oligocene); Bolderian of Dumont; Diestian sands (Pliocene),—the entire hill standing as an island in a sea of Campinian sand (Quaternary). The author shows that the Bolderian is not a separate system, but an upper littoral member of the Rupelian series. The Diestian sands lie upon a denuded surface of the Bolderian; and this break represents the Miocene continental era in Belgium. G. A. L.

——. Rapport sur la traduction faite par M. Mourlon de l'ouvrage de Prestwich, intitulé "On the Structure of the Crag-beds of Suffolk, &c. . . . ." [On M. Mourlon's translation of Prestwich's paper.] Proc.-verb. Soc. Mal. Belg. t. iii. pp. v.–xi.

The connexion between the series described by Prof. Prestwich and the Antwerp beds is insisted on.

——. Rapport sur les sondages de la province d'Anvers par M. O. van Ertborn. [Borings in the province of Antwerp.] Ann. Soc. Géol. Belg. t. i. Mém. pp. 28–31.

From an examination of fossils from these borings the Reporter concludes that in that district the Middle Eocene is chiefly represented by its upper part or *Laekenian* system. G. A. L.

Vidal, Luis M. Datos para el conocimiento del Terreno Garumnense de Cataluña. Bol. Com. map. geol. Españ. vol. i.

Describes the supra-Cretaceous deposits of Catalonia, which he considers equivalent to the Garumnian of the Pyrenees. There are 3 sections and 7 plates of fossils. J. M'P.

Vieillard, E. F. Le terrain houiller de Basse-Normandie, ses ressources, son avenir. [Coal Measures of Lower Normandy, their resources, and their future.] Pp. 166, 5 pl. 8vo. Caen.

Vincent, G. Matériaux pour servir à la Faune Laekenienne des environs de Bruxelles. [Materials for the Laekenian Fauna of the neighbourhood of Brussels.] Ann. Soc. Mal. Belg. t. viii. Mém. pp. 7–15.

A list of the Laekenian fossils found in this locality, with their distribution not only in the two great divisions recognized in this formation (the Laekenian proper and the Bruxellian), but also in five zones distinguished as follows:—*Laekenian*: Upper Zone, with *Nummulites Heberti* and *Cyprina Roffiaeni*; Lower Zone, with *N. Heberti*; Zone with *N. lævigata* and *N. scabra* (rolled). *Bruxellian*: Zone of calcareous sands, with *Rostellaria ampla*, &c.; Zone of sands with vitreous grits, characterized by *Cytherea suberycinoïdes*. All these zones are subdivisions of the great Laekenian zone characterized by *N. variolaria*, *Ditrupa strangulata*, and *Orbitolites complanata*. G. A. L.

Vincent, G. Note sur les dépôts post-pliocènes du Kiel, près d'Anvers. [Post-pliocene deposits of Kiel, nearAntwerp.] Proc.-verb. Soc. Mal. Belg. t. iii. pp. xiv–xvii.

Two zones. The lower composed of three beds:—1, at the base, a bed of shelly re-assorted gravel lying immediately on a denuded *Diestian* surface; 2, greenish sand with small shell-débris; 3, brownish loam with land and freshwater shells and insects. The upper zone consists of sands without fossils. Short lists of fossils are given. G. A. L.

Viollet-Leduc, E. Nouvelle carte topographique du massif du Mont-Blanc à l'échelle de $\frac{1}{40000}$. [Note on his new map of Mt. Blanc.] Compt. Rend. t. lxxviii. pp. 476–479.

This map is meant to show the larger geological structure of the mountains, and is specially accurate in its glacial delineations.

Voisin, H. Le sondage de Sperenberg (Prusse). [Boring at Sperenberg.] Ann. d. Mines, 7 sér. t. v.

An abstracted translation of papers published by Kestner and Dunker in the Zeits. Berg-, H.- u. S.-Wesen, vol. xx. This boring has discovered a bed of rock-salt thicker than any yet known, at a depth of 293 feet; and the boring was stopped at 1390 feet, still in salt. Observations of temperature were taken in the bore-hole, and the mean rise was found to be about 1° F. per 50 feet, or, more exactly, 1° C. per 33·83 metres. Tables of these observations are given. G. A. L.

Vukotinovic, L. von. *Valenciennesia annulata*, Rous, in den Congerienschichten bei Agram. [*Valenciennesia annulata* in the "Congeria-beds" near Agram.] Verh. k.-k. geol. Reichs. pp. 121, 122.

Gives reasons for believing that the beds with *V. annulata* do not belong to the "Sarmatian," but are not older than the "Congeria-beds."

——. Die Tertiärschichten in der Umgebung Agrams. [Tertiary beds in the neighbourhood of Agram.] Jahrb. k.-k. geol. Reichs. Bd. xxiv. Heft 3, pp. 275–286 (with 4 woodcuts).

The Tertiary beds in the Agram district consist of two divisions. The lower are sandy marls, sandstones, &c. of the age of the "Leithakalk;" they put on the appearance often of Nullipore-limestone rich in fossils; one small bed of coal is mentioned. The upper beds begin with *Cerithium*-beds, which are fully developed, and are succeeded by the *Congeria*-beds, which form the bulk of this division. E. B. T.

Walter, Henry. Przekroj z Chyrowa do Lupkowa w porownaniu z innemi przecieccami w Karpatach. [Section from Chyrow to Lupkow as compared with other Sections in the Carpathians.] Akademija umiejetnosci w Krakowie [Ac. Sci. Cracow], vol. viii. pp. 206–212.

Woldrich, Dr. J. Mittheilungen aus Dalmatien. [Communications from Dalmatia.] Verh. k.-k. geol. Reichs. pp. 185–189.

Gives short descriptions of observations on the Triassic, Cretaceous, Eocene, Neogene, and Diluvial deposits of Dalmatia.

Wolff, H. Die Gesteine des Gothard-Tunnels. [Rocks of the St. Gothard Tunnel.] Verh. k.-k. geol. Reichs. pp. 140–145.

Gives a detailed account of the rocks passed through.

——. Das Bohrloch von Pristoupin bei Böhmisch-Brod. [The boring of Pristoupin.] Verh. k.-k. geol. Reichs. pp. 383–387.

Gives the chief geological features connected with borings undertaken near Böhmisch-Brod with the view of discovering whether the Coal was present beneath the Rothliegende. H. A. N.

Wrightson, Prof. J. Report on the Agriculture of the Austro-Hungarian Empire. Journ. Roy. Agric. Soc. ser. 2, vol. x. pp. 305–390.

Account of the Physical Geography, Scenery, Soils, &c. of the countries described, pp. 306–316. The remainder of the Report is almost purely agricultural. Under the head of "Land Drainage" is a note on the rapid wearing-action of water in the hill-districts on the flanks of the Carpathians. W. T.

Zareczneg0, Dr. St. O sredniem ogniwie warstw cenomanskich w Galicyi wschodniej. [The middle links of the Cenomanian of Eastern Galicia.] Akademija umiejetnosci w Krakowie [Ac. Sci. Cracow], vol. viii. pp. 99–183, 2 plates (fossils), 1 woodcut (section).

The fossils are fully noticed, with references to their literature, and the following new species are described:—*Solarium Kneri, Emarginula Althi, Terebratula podolica.* W. W.

Zawissa, Jan. Poszukiwana Archeologiczne w Polsce. Recherches Archéologiques en Pologne. Pp. 35. 8vo. Warsaw. 21 plates (plans, flint implements, fossils), 1 woodcut view.

Describes some of the bone-caves of Poland and their contents. One of the caves is known as the "Caverne du Mammouth," in consequence of the abundant remains of the mammoth which it has yielded. It is also rich in other Pleistocene mammals, and has yielded nearly 2000 implements. This cave is situated in the principal valley of Wierszchow. Another bone-cave occurs in a lateral valley. The author maintains that the caves of Poland afford evidence of three divisions of the stone age. F. W. R.

Zittel. Ueber Gletscher-Erscheinungen in der bayerischen Hochebene. [Glacial Phenomena in Bavaria.] Sitzungsb. math.-phys. Classe k. b. Akad. Wissen. Heft iii. pp. 252–283.

From observations in the Upper Bavarian plateau the author recognizes the following subdivisions of the Drift:—*Preglacial*: loose stratified diluvial gravel or solid Nagelflue. *Glacial*: 1. Gravel with scratched pebbles, erratics, moraines, and striated rocks; 2. Loess and loam, alpine shells, bones of *Elephas*, &c. *Postglacial*: upper stratified gravels, peat with *Betula nana*, &c. Formation of present beds of the rivers Ammer, Würm, Isar, &c. F. W. R.

Zohrab, Consul. Report on the Bituminous Coal-field of Ekaterinoslaw, Southern Russia. Reports from Her Majesty's Consuls, Commercial No. 5, Part 1. 8vo. Pp. 225–230. (See p. 45.)

Zuarznavar, Mariano. Datos geologico-mineros de la Provincia de Burgos. Bol. Com. map. geol. Españ. vol. i.

Sketches the Geology of the Province of Burgos, and describes a coal-field near Villasur.

Zugmayer, H. Ueber das Vorkommen von Bone-bed-Schichten im Piesting-Thale in Nieder-Oesterreich. [The "Bone-bed" in the Piesting valley, Lower Austria.] Verh. k.-k. geol. Reichs. p. 396.

Records the occurrence in the Piesting valley, between Piesching and Waldegg, of deposits referable to the Rhætic "Bone-bed" with its characteristic fossils. H. A. N.

Trabajos geodésicos y topográficos practicados por la Comision de estudio de las cuencas carboniferas de Asturias. Mem. Com. map. geol. Españ.

The result of the labours of a Government Commission to explore and describe the extensive and distorted coal-field in the centre of the Asturias. There are 3 plates, one being a detailed map of the coal-region on a scale of $\frac{1}{50000}$. **Don F. Botella** was in charge of the work, and was assisted by MM. **Cifuentes**, **Abeleira**, and **Moreno**.

J. M'P.

3. *ARCTIC REGIONS.*

Drasche, Dr. R. von. Petrographisch-geologische Beobachtungen an der Westküste Spitzbergens. Min. Mitt. Heft iii. pp. 181–198; Heft iv. pp. 261–268, 9 woodcuts (sections &c.).

Observations on the rocks of the west coast of Spitzbergen, between Bel Sound and Amsterdam Island. The first paper gives a list of geological writings on Spitzbergen; then describes the occurrence of gneiss, granite, and crystalline slates; and afterwards that of the sedimentary rocks, including the Hecla-Hook formation, the Carboniferous Limestone, and the Trias. The second paper describes the diabases of Spitzbergen, gives original analyses of them, and notes the occurrence of sedimentary rocks of Jurassic, Cretaceous, and Tertiary age. F. W. R.

Grad, Charles. Sur l'émersion et le soulèvement des terres polaires arctiques aux îles Spitzbergen et Novaja-Semlja. [Emersion and upheaval of the North Polar regions.]

Maintains that the old Dutch maps representing many of the promontories of the Spitzbergen mainland as islands were correct, and that a measure of the rate of emergence of the land is thus afforded. In 1594 a sandbank, 18 fathoms below the surface, alone marked the present Gulf-stream islands east of Cape Nassau. In this case the upheaval has been at the rate of 30 metres in less than 300 years. G. A. L.

Heer, Oswald. Die Schwedischen Expeditionen zur Erforschung des hohen Nordens vom Jahre 1870 und 1872–3. [The Swedish Arctic Expeditions of 1870 and 1872–73.] 8vo. Zurich.

——. [Arctic Geology.] N. Jahrb. Heft iii. pp. 278, 279.

Letter giving a sketch of the writer's forthcoming work on the Cretaceous Flora of the Arctic regions, and of the Supplement to his Miocene Flora of Greenland. It also contains a brief notice of the fossil plants brought home by the last Swedish Expedition. F. W. R.

Heuglin, M. Th. von. Reisen nach dem Nordpolarmeer in den Jahren 1870 und 1871. 3. Theil: Beiträge zur Fauna, Flora und Geologie von Spitzbergen und Novaja Semlja. [Voyages to the North-polar Sea in 1870–71. Contributions to the Fauna, Flora, and Geology of Spitzbergen and Nova Zembla.] 360 pp., 1 plate. 8vo. Braunschweig.

Contains the geological observations made during the expeditions.

Höfer, Hanns. Beiträge zur Geographie Süd-Spitzbergens. [Contributions to the Geography of South Spitzbergen.] Petermann's Mittheilungen, Bd. xx. pp. 219, 297–305.

A record of the geological observations made during Count Wilczek's north-polar expedition. The paper is under three heads:—1. General; 2. On the structure of Spitzbergen, especially in the Horn-Sound region, with much stratigraphical and lithological information; 3. On glaciers, with notes on the formation of fjords &c. The second part is on the structure of Nova Zembla. G. A. L.

Koldewey, Capt. A Narrative of the Wreck of the Hansa in the Ice. Contains geological information.

Nordenskiöld, —. Observations faites pendant un séjour fait l'été dernier dans les régions polaires. [Notes of a sojourn in the polar regions.] Compt. Rend. t. lxxviii. pp. 236–239.

A continuation of notes already printed. It especially relates to the coaly dust with metallic iron observed on the ice and snow of the inland ice-sheet of Geeenland. The dust has been found to contain *nickel* and *cobalt*. An account of the glacier-structure of North Ostland is given. Many fossil plants were collected from various formations in Bel Sound and Research Bay. Seven formations are recognized, ranging from a period between the Devonian and the Carboniferous to the Miocene. G. A. L

Steenstrup, K. J. V. Bemerkungen zu der geognostischen Uebersichtskarte der Küsten des Waigattes in Nord-Grönland. [On the Geological-Survey Map of the Waigatt coasts in North Greenland.] Petermann's Mittheilungen, Bd. xx. pp. 142–144, map.

A description of the rocks observed on the southern shores of the Nûgssuak peninsula and the northern shores of Disko Land. The rocks distinguished are coal-bearing sandstones and shales, trap, and gneiss. G. A. L.

Toula, Fr. Kohlenkalk- und Zechstein-Fossilien aus dem Hornsund an der Südwestküste von Spitzbergen. [Fossils from Carboniferous limestone and Zechstein, S.W. coast of Spitzbergen.] Sitzungsb. k. Ak. Wiss. 1. Abth. lxx.

Urba, K. Beiträge zur Kenntniss der Gesteine Süd-Grönlands. [Contributions to a knowledge of the rocks of South Greenland.] 33 pp., 3 pls. 8vo. Vienna.

4. *AMERICA.*

Allen, J. A. Metamorphism produced by the burning of Lignite Beds in Dakota and Montana. Boston.

Andrews, E. B. On the parallelism of Coal-seams. Amer. Journ. ser. 3, vol. viii. pp. 56–59.

A rejoinder to Dr. Newberry's critique [see p. 125], in which the writer adheres to his belief in general and well-marked parallelism of coal-seams, "such as makes the stratigraphy of our coal-fields a system of symmetry and beauty." He does not believe in the theory of unequal subsidences &c. G. A. L.

Anon. Corundum. Popular-Science Monthly, Feb., New York.

Account of Col. Jenks's researches respecting the Corundum veins of North Carolina.

——. Cave at Kutztown, Berks Co., Pa. Amer. Journ. ser. 3, vol. vii. p. 77.

Note announcing the discovery of this stalactitic cave.

——. Note on the Geology of Costa Rica [letter]. Amer. Journ. ser. 3, vol. vii. pp. 438, 439.

The sedimentary rocks of the Atlantic slope of Costa Rica, usually highly metamorphosed, are certainly Tertiary; the writer is further convinced that they are Eocene. Wherever dykes cut up the metamorphic shale and sandstones, auriferous quartz-veins occur, and placer deposits exist in most of the streams that run from the margins of the volcanic belt. G. A. L.

——. Lake-Superior Iron Mines. Coll. Guard. vol. xxviii. p. 532.

Note from the U.S. Railroad and Mining Register. This great iron-region lies 12 to 30 miles back from Marquette, and reaching into Wisconsin, a distance of 150 miles. The ores are chiefly specular, brown hæmatites, and magnetic. G. A. L.

——. Coal and Iron in California. Coll. Guard. vol. xxviii. p. 533.

Note from the Journal of Commerce (U.S. ?) announcing the discovery of vast coal-deposits on the line of the Ione railroad, and of the existence of iron-deposits in the same direction. G. A. L.

Ansted, Prof. D. T. Account of a recent visit to the Coal and Iron Fields of Virginia. Journ. Soc. Arts, vol. xxii. pp. 182–188; see also no. 1107, p. 230, and Coll. Guard. vol. xxvii. pp. 180, 181.

The iron-ores are of two kinds and in two geological positions. East of the Blue Ridge there are bands of magnetite ranging N.E. and S.W., and ridges with cores of compact rich ore (chiefly peroxide); west of the Blue Ridge, in the valley that extends towards the Appalachians, there are contorted Silurian and Devonian rocks with, at intervals, a band of brown hæmatite and a thinner bed of rich peroxide. In many cases limestone-bands alternate with the ironstone. The coal-seams are noticed, and also the economical bearings of the subject; and a long discussion follows. W. W.

Aramayo, Avelino. Bolivia. Extracts from a work published in London in 1863, pp. viii, 104. 8vo. London.

I. Present State of Mining, pp. 1–8. II. Means that should be employed for the Advancement of Mining Industry, pp. 8–20. Topographical Report of the engineer, Hugo Reck, pp. 60–68.

Slight reference to geological subjects. W. W.

Avé-Lallemant, H. E. Erfahrungen im Goldbergbau in der Argentinischen Republik." [Gold-mining in the Argentine Republic.] La Plata-Monatschrift, August, pp. 192–194; September, pp. 205, 206 (1873); and January, pp. 6, 7 (1874).

Contains some geological and mining details with reference to gold-mining in the district.

Belt, Thomas. The Naturalist in Nicaragua, pp. xvi, 403 (4 geological and mining sections). 8vo. Lond.

The author believes that metalliferous veins have been formed by igneous injection, but admits that many have had their materials rearranged by hydrothermal and other agencies, and gives details as to the mode of occurrence of the gold-bearing quartz reefs of Central America. He saw Boulder Clay up to heights of 3000 feet; and, according to him, the results of glacial action are very marked and wide-spread in the American tropics. He believes in the presence of an ice-cap during the Glacial period, and suggests that many tropical species that lived before and after that time migrated to the lands left vacant by the lowering of the sea through the arrest of large volumes of water in frozen masses over the land, and suggests the possibility of the existence, during the glacial period, of the fabled Atlantis, and of a large Malayan and Polynesian continent. The origin of lake Nicaragua is discussed, as well as the general physical geography of the surrounding regions. C. E. DeR.

Blake, James. Trachytic and doleritic rocks in alternations in the Puebla range of mountains, in the northern part of Humboldt County, Nevada. Amer. Journ. ser. 3, vol. vii. pp. 235, 236.

Short abstract of paper in Proc. Calif. Ac. Sci. vol. v. p. 210 (1874?).

Blandy, John F. Topography, with especial reference to the Lake-Superior Copper District. Trans. Amer. Inst. Min. Eng. vol. i. pp. 75–82.

Shows the connexion of surface-features with geological structure, and their importance to the mining engineer.

Brady, Sir Antonio. Report on Splint Coal Property: the proposed site of Kanawha city, West Virginia, U. S. A. 8vo. Lond. Pp. 1–16, woodcuts. [Privately printed.]

A section of the Coal Measures on the banks of Great Kanawha river is given, with the thickness of each coal-seam.

Broadhead, Garland C. Report of the Geological Survey of the State of Missouri, including Field-work of 1873–74, with 91 illustrations and an atlas. Pp. 734, 2, 2, 4,—28 plates (sections and plans). 8vo. Jefferson City.

Chap. 1. Introductory. Chap. 2. General Geology. Chap. 3. Caves, Supplies of Water. Chap. 4. Soils. Chap. 5. Minerals, Rocks. Chap. 6. S.W. Coal-field. Chaps. 7–21. Descriptions of various Counties, with details of sections, analyses of iron-ores, and reference to economic matters. These chapters are partly by C. J. NORWOOD. Chaps. 22–28. Lead and Zinc regions of S.W. Missouri, by A. SCHMIDT and A. LEONHARD, with descriptions and analyses of ores, minerals, and rocks. Chaps. 29–32. Lead Region of Central Missouri, by A. SCHMIDT, with descriptions and analyses of minerals and rocks. Chap. 33. Iron Ores of Missouri, by A. SCHMIDT. Chap. 34. Lead Mines, S.E. Missouri, by J. R. GAGE. Chap. 35. Iron Ores of S.E. Missouri, by P. N. MOORE. Appendices. History of Lead-mining, Statistics, Mineral Springs, and Chemical Analyses, by R. CHAUVENET. The Atlas contains 11 maps, some coloured geologically, and 4 sheets of vertical sections. W. W.

BURBANK, L. S. Observations on the Surface-Geology of N. Carolina, with special reference to some phenomena of the Drift of the northern United States. Proc. Boston Nat. Hist. Soc. vol. xvi. pt. 2, pp. 150–155.

Describes the boulder-like forms of this district, and shows that they are not the result of attrition, but of chemical and atmospheric agencies acting upon concretionary rocks: this structure of the granite is noticed in railway-cuttings in Guilford Co. The decomposed state of the crystalline rocks and the resulting clays are noticed. In relation to the Drift, it is argued that the force of that period was exerted, not in wearing and grinding down the solid rocks, but chiefly in carrying forward and commingling the materials already disintegrated. From the comparatively small amount of disintegration that has gone on since the Drift period, the author concludes that the time which has since elapsed must be short compared with the ages during which the rocks had been previously undergoing decomposition by atmospheric agencies. E. B. T.

CHASE, A. W. The auriferous Gravel Deposit of Gold Bluffs. Amer. Journ. ser. 3, vol. vii. pp. 379–384.

This deposit is on the coast-line of Klamath County, California. The author thinks it is due to a great river occupying formerly the bed of the Klamath, but having a different debouchure. He adds a note from Prof. Dana, who thinks it probable that the deposit dates partly from the close of the glacial era and partly from the later portion of the Champlain period. Information as to the working of the gold is given. G. A. L.

CLARK, R. N. Iron and Coal in Colorado. Coll. Guard. vol. xxviii. pp. 531, 532.

There are in Colorado the "Cañon-City," the "Trinidad," and the "Cucharas-river" coal-fields. The last is unsurveyed. The first contains about 34 square miles, with two principal seams, one 64 inches thick, and worked. Two analyses of this coal are given. Iron-ores exist near the coal (clay-ironstone and magnetic ore). In the Trinidad

coal-field a seam 3 feet thick is worked, on account of its value for gas and coke; iron also exists here. Analyses of the ores are given.
G. A. L.

Clark, R. N. The Tertiary Coal-beds of Canyon City, Colorado. Trans. Amer. Inst. Min. Eng. vol. i. pp. 293–298, map.

These coal-bearing rocks are about 600 feet thick, and contain at least nine seams, from 8 inches to 6 feet in thickness. They extend over about 34 square miles, and consist of sandstones and shales. "The shales and slates contain but few fossils; the sand-rocks are full of the leaves of the oak, the *Cinnamomum*, and the *Calamopsis*." F. W. R.

Comstock, T. B. Addendum to Article xlvii. vol. vi. Amer. Journ. p. 151.

Letter stating that a review of the writer's Silurian fossils from the Wind-River mountains has resulted in the discovery that this formation is made up of rocks of the Quebec group of the Calciferous Epoch, overlain by a considerable thickness of the Niagara Limestone. The last and the Oriskany Sandstone are new to this region. The age of the Bridger and Green-River groups is in dispute (Miocene or Eocene).
G. A. L.

Cope, Prof. [E.]. On the age of the Lignite and other corresponding formations of the West, and especially its supposed equivalent in Northern Colorado. Proc. Ac. Nat. Sci. Philadel. part 1, pp. 12, 13, also p. 10.

The beds are regarded as Cretaceous, on the evidence of their vertebrate remains.

Cox, Prof. E. T. Fifth Annual Report of the Geological Survey of Indiana, made during the year 1873. Pp. 494, 4 maps in cover. 8vo. Indianapolis.

Consists of the usual detailed reports of the examination of various parts of the State of Indiana by the divisions of counties, each of which is illustrated by a special map. The counties particularly noticed are chiefly in the southern portion of the State, in the district between the Ohio and the Wabash River, the special reports being by W. W. **Borden**, J. **Collett**, and G. M. **Levette**. The rocks are chiefly of the Subcarboniferous Limestone series, but in parts lower rocks down to the Hudson River or Cincinnati group of the Lower Silurian series. A noticeable feature appears to be the intercalation of beds showing marine conditions in the Carboniferous series as we pass southward, the coal-bearing rocks being in places found to contain thick beds of limestone with a corresponding impoverishment in coal. There are numerous analyses of coals, especially with regard to their coking power, and of iron-ores, in different parts of the report, according to their occurrence in the different counties. The manufacture of cement, which is now carried on to some extent in Indiana, from the more argillaceous beds of limestone, is described in detail, with analyses of the materials employed. Details of the agricultural conditions of the country, especially with regard to the important industry of fruit-growing, form an important item of the different reports on economic geology. There is also information in reference to the caverns of the limestone-districts, and of the traces of the aboriginal inhabitants afforded by the so-called "bone-banks" and the pyramid-mounds. The geological portion of the report is prefaced by a special report made by Prof. Cox on the Vienna Exhibition, which he attended as Commissioner from the State of Indiana, and another on the manufacture of Spiegeleisen in the Rhenish Westphalian district, by Mr. Hugh Hartmann.

A new reptile footprint is described and figured, *Colletosaurus Indianensis* (Cox), from the base of the Coal Measures. H. B.

Coxe, Eckley, B. A new method of sinking Shafts. Trans. Amer. Inst. Min. Eng. vol. i. p. 261, part of plate ii.

Geological sketch of the territory to be worked (Anthracite Coal Measures, north of Pottsville), with sections of collieries, pp. 261–264.

Crawford, R. On a projected Railway Route over the Andes, from the Argentine Republic. Journ. R. Geogr. Soc. vol. xliii. 1873 [really pub. in 1874], pp. 46–54.

Details as to the character of the soil along the route are given, and an account of the minerals of economic value known in the district, at pp. 52, 53. G. A. L.

Cunningham, R. O. On the Physical Features and Natural History of Southern Patagonia and Tierra del Fuego. Proc. Belfast Nat. Hist. and Phil. Soc., session 1872–73, pp. 40–50.

Some general geological information given.

Dana, Prof. J. D. The Slates of the Taconic Mountains of the age of the Hudson River or Cincinnati group. Proc. Amer. Assoc. vol. xxii. B. pp. 27–29.

The Berkshire (Stockbridge) Limestone is said to be proved to underlie the Taconic slates, which were formerly supposed to be the older rocks. This confirms the view of Prof. Rogers that the Taconic slates are Hudson-River slates. The Trenton and Hudson-River or Cincinnati groups are then *the true Taconic system.* G. A. L.

——. On Staurolite Crystals and Green-Mountain Gneisses of the Silurian age. Proc. Amer. Assoc. vol. xxii. B. pp. 25–27.

Announces the discovery of Staurolite-bearing mica-schists in Southern Canaan *overlying* the Stockbridge or Canaan limestone. The age of the latter is Lower Silurian. This overlying mica-schist in places passes into gneiss. Concludes from these and other similar facts, that all old-looking Green-Mountain gneisses are not pre-Silurian, and that the presence of Staurolite is no evidence of a pre-Silurian age. G. A. L.

——. Reasons for some of the changes in the subdivisions of Geological time in the new edition of Dana's Manual of Geology. Amer. Journ. ser. 3, vol. viii. pp. 213–216.

The changes justified are as follows:—1. *Archæan* for Azoic. 2. *Primordial* or *Cambrian period,* from which the Calciferous sandrock is removed, and the name Potsdam dropped. 3. *Canadian period*, including the Calciferous sand-rock and the Chazy limestone. 4. *Trenton period*, Trenton limestone and Cincinnati group—Hudson-River group being dropped. 5. *Upper Silurian, Oriskany period*, the latter being transferred to the Silurian from the Devonian. 6. *Devonian age, Catskill period*, additional information being required before the Catskill group can be allowed to be equivalent to the Chemung. 7. *Quaternary*, in which is merged the age of man. G. A. L.

Dawson, G. M. Report on the Tertiary Lignite formation in the vicinity of the 49th parallel. British North American Boundary Commission, Geological Report of Progress for the year 1873. 8vo. Montreal: pp. 31, two plates.

This is a general description of the Tertiary Lignite formation which overlaps the Cretaceous formations west of Red River. This is undoubtedly an extension of the Great Lignite or Fort-Union group of Hayden. It is the lowest known American representative of the Tertiary series. The flora has a Miocene aspect; and the fauna is chiefly freshwater. Many sections are given (on West Souris River, on Missouri Coteau west of 363-mile Point, in Porcupine Creek and tributary valleys), and many analyses of lignites and ironstones. G. A. L.

Dawson, Principal J. W. On the Upper Coal-formation of Eastern Nova Scotia and Prince-Edward Island in its relation to the Permian. Quart. Journ. Geol. Soc. vol. xxx. pp. 209–219.

This formation is an upper series, lying above the productive Coal Measures, and is distinguished by the absence of thick coal-seams, and by the occurrence of red and grey sandstones and red shales with plants of Permian affinity. No break is observable between these beds and the Trias above. The author proposes for them the name *Permo-Carboniferous* (already given to some limestones in the West), on account of the strong resemblance which they bear to the Permian of Europe, to which they are more nearly allied than to the Permian of the interior of North America. A list of fossils is given, and two transverse sections. G. A. L.

——. On the geological relations of the Iron Ores of Nova Scotia. Proc. Amer. Assoc. vol. xxii. B. pp. 138–146, 1 fig. in text.

These ores are considered under the following heads:—

Bedded Ores.—1. Great Hematite bed of the lower Helderberg series (E. branch of East River, Pictou, and upper part of Sutherland's River), 30 feet thick, with 10 to 20 feet of good ore. 2. Hematite and magnetic iron of Nictaux and Moose River. In Oriskany Sandstone. 3. Bedded ores of the Carboniferous system. In Pictou. True spathic iron and clay ironstones. *Veins of Iron Ore.*—1. Great specular-iron veins of the Silurian slates and quartzites. Cobequid Mountains &c. 2. Limonite veins of East River, Pictou. 3. Limonite of Shubenacadie, Old Barns, and Brookfield. 4. Iron veins of the Triassic trap. Magnetite and specular iron in great beds of trap, associated with the Triassic Red Sandstones of the Bay of Fundy. G. A. L.

Drinker, H. S. Abstract of a paper on the Mines and Works of the Lehigh Zinc Company. Trans. Amer. Inst. Min. Eng. vol. i. p. 67.

Account of the position, rocks, and minerals of the mines, pp. 67, 68.

Desor, E. Le Parc National des Etats-Unis. Bull. Soc. Sci. Nat. Neuchâtel, t. x. 1r cahier, pp. 100–109.

A general account of the Yellowstone tract.

Doering, Dr. D. A. Estudios sobre la proportion quimica y fisica del terreno en la formacion de la Pampa. [Chemical and physical investigation of the Pampas formation.] Bol. Acad. Nac. Cordova, pt. iii. [With analyses of soils.]

Douglas, James. The Native Copper Mines of Lake Superior. Quart. Journ. Sci. no. xlii. pp. 162–180, with chromo-lithographic plate; and Canad. Nat. (N.S.) vol. vii. no. 6, pp. 318–336.

A sketch of the geology of the copper-mining region of Lake Superior, with special descriptions of the Quincey Mines, opened on the Pewabic lode, in amygdaloidal trap, and of the Calumet and Hecla mine, worked on a bed of copper-bearing conglomerate. Describes the methods of mining and dressing the ores, and gives statistics of production. F. W. R.

Fontaine, Wm. M. The "Great Conglomerate" on New River, West Virginia. Amer. Journ. ser. 3, vol. vii. pp. 459–465, 573–579.

A discussion of the age of a great formation of sandstones, containing important beds of coal, which in the hills along New River crop out for nearly forty miles from beneath the lowest beds of the Lower Coal series. The author, with Prof. W. B. Rogers, believes this formation to be the equivalent of the "Great Conglomerate." He concludes by suggesting that the successive formation of coal on a large scale along the S.W. border of the Appalachian coal-field, commencing in the Devonian period, may point to the existence at this time of a continental mass nearer than the Azoic of Canada. Details regarding the Kanawha coal-field are given. G. A. L.

Fraser, Prof. P., Jun. On the Geology of Certain Lands in Ritchie and Tyler Counties, W. Va. Proc. Ac. Nat. Sci. Philadel. p. 168.

——. [Remarks on the Pilot-Knob, Iron-Mountain, and Mine-La-Motte districts, Missouri.] Proc. Ac. Nat. Sci. Philadel. part ii. pp. 85, 86.

Fulton, John. Note on the Somerset-County Coal beds in Pennsylvania. Proc. Amer. Phil. Soc. vol. xiv. no. 92, pp. 157, 158.

Gabb, W. M. Notes on the Geology of Costa Rica. Amer. Journ. ser. 3, vol. viii. pp. 838–390.

A letter. Chiefly an account of an ascent and examination of Pico Blanco, which the writer says is *not* a volcano, although its summit exposes a dyke bared by denudation. The mountain, 10,200 feet high (1500 feet lower than formerly supposed), is "the culminating point of a granite intrusion from below Miocene rocks." G. A. L.

Gilpin, Edwin. Notes on the Coal Measures and Lower Carboniferous Strata of Western Newfoundland. Trans. N. Engl. Inst. Eng. vol. xxiii. pp.167–176, plate xxxv. (sketch Map).

Account of the geology of that part of Newfoundland which lies between the great range of Laurentian hills and the sea, from Cape Ray to Port-à-Port. The rocks described belong to:—1, partly metamorphosed lowest Carboniferous Conglomerates, about 1300 feet; 2, Lower Carboniferous Marine Limestone group, with gypsum and marls, 2150 to 2500 feet; 3, Millstone Grit, consisting of coarse sandstones with occasional layers of pebbles of limestone, 6000 feet (?); 4, Middle or productive Coal Measures in small patches with thin seams of good coal, from 6 inches to 4 feet, 600 feet at least. G. A. L.

——. Sketch of the Carboniferous District of St. George's Bay, Newfoundland. Trans. Nov. Scot. Inst. (9 pp.)

Describes part of the S. shore of Newfoundland and the adjoining inland tract. There are frequent exposures of L. Carboniferous rocks—red sandstones, conglomerates, limestones, coals, and a thick bed of gypsum being noticed. S. of St. George's town and 6 miles inland is a spur of older rocks with an immense deposit of magnetite. The action of the sea on the limestones of East Bay has formed pillars and caves; and here is a large deposit of barytes. Between East and West Bays indications of petroleum occur. W. W.

Goldsmith, E. The Blue Gravel of California. Proc. Ac. Nat. Sci. Philadel. part ii. pp. 73, 74.

This gravel underlies the gold-bearing alluvium of California and Nevada, and consists of pebbles of slate and hornblende-rock in an acidic lava, with crystals of biotite and grains of gold. A. H. G.

Hall, Prof. James. On the Relations of the Niagara and Lower Helderberg Formations, and their Geographical Distribution in the United States and Canada. Proc. Amer. Assoc. vol. xxii. B. pp. 321–335.

A protest against the view that the Niagara and Lower Helderberg formations of North America are in reality identical, and that the latter formation has therefore no existence as a distinct group in the Upper Silurian. From this view Professor Hall dissents; and his paper contains an enumeration of the more important facts, which prove the Lower Helderberg group to be an independent division. H. A. N.

Harden, J. W. The Brown Hematite Ore Deposits of South Mountain, between Carlisle, Waynesborough, and the South-eastern edge of Cumberland Valley. Trans. Amer. Inst. Min. Eng. vol. i. pp. 136–144.

The ore, which lies along the slopes and valleys of the spurs and ridges of the mountain, associated with clays and sands, is the residue of decomposition of the slates and limestones (Silurian), and has generally a red gravelly covering from 5 to 20 feet thick, evidently a surface-wash. An analysis is given. W. W.

Hartt, C. F. Contributions to the Geology and Physical Geography of the Lower Amazonas. Bull. Buff. Soc. Nat. Sci. pp. 201–235, 10 woodcuts (map and views, &c.).

Describes the features of the Ereré-Monte-Alegre district and the table-topped hills. The flat hills of Monte Alegre are 500 or 600 feet high, and of horizontal clays and sands, probably Tertiary. The plain at their western foot is of Devonian rocks, with fossils. At the southern part of this plain there are ridges, or "serras," of sandstone, the age of which is yet uncertain (whether older or newer than the beds of the plain). One of the "table-topped hills," named Paranáquára, was selected for examination, most previous descriptions of these being erroneous. It consists of horizontal beds of clays, sandstones, and loams, without fossils; but the author thinks that they may be Tertiary. W. W.

——. Report of a Reconnaissance of the Lower Tapajos. Bull. Cornell Univ. vol. i. no. 1, pp. 11–37, 1 plate (plan).

Describes various rocks noticed along the river—Porphyry, Carboniferous beds (with analysis of limestone) partly fossiliferous (marine shells and plants), and beds probably of Tertiary age. There is as yet no evidence to show whether coal exists on the Amazonas or not; but the extent of the Carboniferous basin suggests the advisability of a government survey. W. W.

Hayden, Dr. F. V. Annual Report of the United-States Geological and Geographical Survey of the Territories, embracing Colorado, being a Report of Progress of the Exploration for the year 1873. Pp. xii, 718, 94 plates (maps, views, sections, and fossils). 8vo. Washington.

Part I. Geology, Mineralogy, and Mining Industry. General Report, by Dr. Hayden, and the following Reports on special districts:—on the Middle Park Division, by A. R. Marvine, pp. 83–192, with analyses of lignitic coals and details of sections; on the South-Park Division, by Dr. A. C. Peale, pp. 193–273, with details of sections and catalogues of minerals and rocks; on the San-Luis Division, by F. M. Endlich, pp. 275–361, with mining geology and mineralogical notes. Part II. Special Reports on Palæontology, see *post*, under Lesquereux (Botany) and Cope (Vertebrata). Part III. Zoology. Part IV. Geography and Topography, with lists of heights. Appendix: on the Gold-Hill Mining Region and its Telluride Ores. W. W.

Heinrich, Oswald J. The Midlothian Colliery, Virginia. Trans. Amer. Inst. Min. Eng. vol. i. p. 346.

A section of the beds is given at p. 347.

Hilgard, Prof. E. W. Note on Lignite Beds and their Under-clays. Amer. Journ. ser. 3, vol. vii. pp. 208–210.

The author accounts for the apparent absence of all roots &c. in these underclays by analogy with what is now going on in the Cypress-swamps and elsewhere. He holds that there is no foundation for the belief that these Lignite-beds were formed of drifted materials. G. A. L.

Hitchcock, Prof. C. H. Geological History of the Winnipiseogee Lake. Proc. Amer. Assoc. vol. xxii. B. pp. 120–131.

The periods in the history of this lake-basin are thus divided:—1. Period of the deposition of the Porphyritic Gneiss or Granite. 2. Winnipiseogee-Lake Gneiss Formation. 3. White-Mountain Series. 4. Elevation and Metamorphism of first three groups. 5. Eruption of the Granites of the Ossipee Mountains. 6. Deposition of Felsites or Compact Felspars. 7. Eruption of Syenite. 8. Deposition of Mica-schist. 9. Glacier Period. 10. Terrace Period. G. A. L.

——. Note upon the Cretaceous Strata of Long Island. Proc. Amer. Assoc. vol. xxii. B. pp. 131, 132.

The writer reasserts the correctness of his views in marking certain rocks on the northern side of Long Island, in his map, as Cretaceous. Cretaceous fossils lately found there seem to place the matter beyond doubt. G. A. L.

——. The Geology of Portland [Maine]. Proc. Amer. Assoc. vol. xxii. B. pp. 163–175 (1 fig. in text).

A sketch of the geology of the district. The older rocks are described under the heads Gneiss and Granite, Huronian System, and Cambrian. The Post-Tertiary Deposits are more fully considered, their succession, in the author's opinion, being as follows:—1. Glacier Period: country covered with a sheet of ice, pushing towards the ocean and carrying boulders. 2. Leda Clay: submergence to the depth of 40 or 50 feet. 3. Saxicava Period: Littoral Fauna. 4. Terrace Period: submergence. Nos. 1 and 3 together form the Champlain Period, a list of the fossils found in the beds of which is given. G. A. L.

——. Geology of the North-west Part of Maine. Proc. Amer. Assoc. vol. xxii. B. pp. 205–214 (map in text).

Draws the following conclusions from the distribution of the formations in N.W. Maine:—1. "The Oriskany sandstone reposes gently upon Eozoic gneisses." "It can be no longer maintained with reason that these strata pass into New Hampshire in a metamorphosed condition." 2. "The Oriskany is several times thicker than in its extension in the interior and further south in Pennsylvania." 3. "The discovery of new localities of Helderberg Limestone indicates a widespread submergence of Eastern America, in Upper Silurian and Middle Devonian times, of nearly 1500 feet." 4. "There must have been, subsequently to the Helderberg, a period of elevation to bring New England to essentially its present position." G. A. L.

——. On Helderberg Rocks in New Hampshire. Amer. Journ. ser. 3, vol. vii. pp. 468–476, 557–571, 11 figs. and 1 map.

The author thus summarizes his conclusions regarding these Ammonoosuc Helderberg beds:—1. The fossiliferous limestones belong to the Lower Helderberg. 2. The Helderberg series in New Hampshire is several thousand feet thick, and is composed chiefly of limestones, slates, sandstones, conglomerates, and probably hornblende rock. Some of the members are highly metamorphic. 3. These Helderberg beds seem to be newer than the Coös group of the neighbourhood; their lithological character is also different. 4. The Swift-Water series seems more nearly related to the Helderberg than to any of the other formations. 5. The Helderberg rocks are the newest in this "terrane," and the most modern that have yet been discovered in the State. G. A. L.

Holley, George W. The proximate Future of Niagara; in Review of Professor Tyndall's Lecture thereon. Proc. Amer. Assoc. vol. xxii. B. pp. 147–155, with plan in text.

Contradicts several of the statements respecting the geological structure of the Falls in Prof. Tyndall's lecture.

Honeyman, Dr. D. Geology of the Cobequid Mountains, Nova Scotia. Amer. Journ. ser. 3, vol. vii. pp. 148, 149.

Abstract of paper in Proc. Nov. Scot. Inst. (1874?)

——. On the Quaternary containing the New Brunswick fossil cetacean; on Niagara Coral reefs; and on Niagara fossils in trap. Amer. Journ. ser. 3, vol. viii. pp. 219, 220.

Notes in a letter.

Hunt, Dr. T. S. The Coal and Iron of Southern Ohio considered with relation to the Hocking-Valley Coal Field and its Iron ores, with notices of Furnace coals and Iron-smelting, followed by a view of the Coal Trade of the West. Pp. 78, two maps. 8vo. Salem, Mass.

The introduction consists of a general description of the principal geological features of the Appalachian Coal-basin. Details as to the stratigraphical relations of the various workable seams in the Hocking-Valley Coal-fields are next given, with (further on) analyses of the coals. The same is done with regard to the iron-ores of the region. The rest of the report is of a commercial character. Both maps are topographical only, with this exception, that the approximate limit of the coal-bearing series is shown on the first. G. A. L.

——. The Geognostical History of the Metals. Trans. Amer. Inst. Min. Eng. vol. i. pp. 331-346 (with discussion).

Divides the crystalline stratified rocks of Eastern North America into four groups, lithologically and stratigraphically distinct—Laurentian, Norian (or Labradorian=Upper Laurentian of Logan), Huronian, and Montalban (gneiss and mica-schist of the White Mountains),—and thinks it probable that other like formations of crystalline rocks may have been almost entirely swept away. The Laurentian is remarkable for deposits of crystalline iron-ore, chiefly magnetic, the ores occurring in beds or masses of contemporaneous deposition. The Norian is remarkable for titaniferous iron-ores. In the Huronian are the great deposits of hematite and magnetite of Lake Superior; chromic iron-ores seem to be characteristic. The distribution of ores in other rocks is also noticed. W. W.

Hunt, Dr. T. S. Notes on the Geology and Economic Mineralogy of the South-eastern Appalachians. Proc. Amer. Assoc. vol. xxii. B. pp. 113–115 (abstract).

——. Geology of Southern New Brunswick. Proc. Amer. Assoc. vol. xxii. B. pp. 116, 117 (abstract).

——. Breaks in the American Palæozoic Series. Proc. Amer. Assoc. vol. xxii. B. pp. 117, 119 (abstract).

——. On the crystalline Rocks of the Blue Ridge, and on their decomposed condition. Proc. Boston Nat. Hist. Soc. vol. xvi. part 2, pp. 116, 117.

These consist of hornblendic and micaceous schists, completely decomposed to a depth of 50 feet and more, being changed to a reddish unctuous clay, with interbedded layers of quartz, showing the original inclination of the rocks. The removal of the iron-oxide is said to be the source of the large deposits of hydrous iron-ores found at the foot of the Blue Ridge in the Appalachian valley. The decomposition is supposed to have taken place in very ancient times, when there was a highly carbonated atmosphere. To the N.E. an absence of decomposed rocks is held to be due to subsequent denudation, the soft parts being swept away, and the unchanged rock exposed and glaciated. E. B. T.

Irving, Prof. Roland. On the age of the Copper-bearing Rocks of Lake Superior; and on the Westward Continuation of the L. Superior Synclinal. Amer. Journ. ser. 3, vol. viii. pp. 46–56, with sketch map and section.

The Laurentian granitic and gneissoid rocks are overlain uncomformably by the Huronian, which are about 4000 feet thick. These are succeeded conformably by the Copper-bearing rocks, both dipping at a high angle: the latter series consists of traps, conglomerates, sandstones, &c., of an enormous thickness, the upper sandstones alone being 10,000 feet thick. Lying over these nearly horizontally in places are Lower Silurian Sandstones. It is maintained that the traps are comformably interstratified and have been tilted with the others, that the Copper-bearing and Huronian series were once spread out horizontally over one another, that they were disturbed by the same force and received their present tilted positions at the same time, and that the Copper-bearing series should rather be classed with the Archæan than with the Silurian. E. B. T.

Jackson, W. H. Descriptive Catalogue of the Photographs of the United-States Geological Survey of the Territories. United-States

Geological Survey of the Territories, Miscellaneous Publications, 84 pp. 8vo.

Many of the descriptions treat of the rocks shown.

Jenney, Walter P. Notes on the Geology of Western Texas, near the thirty-second parallel. Amer. Journ. ser. 3, vol. vii. pp. 25–28.

Refers to "the occurrence of a remarkable Lower-Silurian section in the Organ Mountains," in which the author recognizes the equivalents of the Potsdam, Calciferous sandrock, Chazy, Trenton, Hudson, Oneida conglomerate (?), and Niagara groups, although the beds identified with the last group may turn out to be of Carboniferous age. The whole series is fairly fossiliferous. The second part of the paper is on the geology of the Llano Estacado, a desert of Cretaceous beds resting on probably Triassic rocks. The "*Caprina* Limestone" of Shumard is recognized with little doubt; and it is the highest bed of this region. G. A. L.

Knox, M. V. B. Drift in Kansas. Amer. Journ. ser. 3, vol. viii. pp. 466, 467.

Extract from a letter describing the drift and boulders of the region.

Le Conte, Prof. Joseph. On the great Lava-flood of the West; and on the construction and Age of the Cascade Mountains. Amer. Journ. ser. 3, vol. vii. pp. 167–180, 259–367 [by a printer's error the pagination runs on from p. 261 to p. 362], 7 figs. in text.

Divided under the following heads:—1. The great Lava-flood: *Extent* (not less than 200,000 square miles); *Source* (from fissures in Coast, Cascade, and Blue-Mountain ranges); *Thickness* (average 2000 feet, extreme not less than 3700 feet). 2. Structure of the Cascade Mountains. 3. Age of the Cascade Range: a *sub-lava* conglomerate with a leaf-bed are the means of ascertaining this. The range began probably at the end of the Jurassic period; but its great bulk was formed at the end of the Miocene. 4. Theory of the ejection of the lava-flood and of the formation of the Cascade Mountains. 5. Some important points suggested by the previous discussion: successive outflows of Cascade lava; relative age of different kinds of lava; Drift-covering in Oregon and Washington; oscillations during Post-Tertiary times on the Pacific Coast; formation of the Cañon of the Columbia River; Prairie mounds. G. A. L.

Lesley, Prof. J. P. The Brown-Hematite-Ore Banks of Spruce Creek, Warrior's-Mark Run, in Huntingdon and Centre Counties, Pennsylvania, along the line of the Lewisburg, Centre-County and Tyrone Railroad. Proc. Amer. Phil. Soc. vol. xiv. no. 92, pp. 19–83 (and 99–107 ?), see also pp. 2–4; 44 illustrations in text (plans, sections, and views), 1 plate (map).

Preliminary Chapter. The area of the district is about 100 square miles. *General Geological Considerations,* pp. 22–30. The rocks are

Upper and Lower Silurian (Clinton Shale to Potsdam Sandstone). A great fault at the foot of Bald-Eagle Mountain is described; and the great erosion of the country is noticed and illustrated by sections showing the former extent of the beds. The ores are considered to be deposits of iron, as hydrated peroxide, set free from the limestones during their slow erosion and dissolution; and the processes of their formation are sketched out. The hematite occurs in pockets, as surface-washes, and in beds. The total visible thickness of Lower Silurian Limestones is 7750 feet. *Practical Value of the Ores. Probable Quantity of Ore. Special Descriptions* (pp. 32–83). Gives details of the Pennington Range, Warrior's Mark, and Lovetown Range, Dry-Hollow Range, Cale-Hollow Range, and Spruce-Creek Range. A chemical investigation of the ores by Dr. Genth (see *post*) seems to be interpolated after p. 83, Prof. Lesley's paper continuing at p. 99 with a description of *Mining Methods. The Fossil Ore Belt* is, lastly, described (pp. 102–107). W. W.

Lesquereux, Prof. Leo. On the Formation of the Lignite Beds of the Rocky-Mountain region. Amer. Journ. ser. 3, vol. vii. pp. 29–31.

Rejects the view that these beds have been formed by the heaping-up of drifted materials.

——. On Remains of Land Plants in the Lower Silurian. Amer. Journ. ser. 3, vol. vii. pp. 31–34.

Confirms the discovery of land-plants in the clays of the Lebanon Beds, in Longstreet Creek, at the base of the Cincinnati group. The specimens belong either to *Sigillaria Serlii* or *S. Menardi*. G. A. L.

——. On the Age of the Lignitic formations of the Rocky Mountains. Amer. Journ. ser. 3, vol. vii. pp. 546–557.

An answer to Dr. Newberry's criticisms [see p. 125]. The author's views regarding these Western Lignites are thus given:—1. The Lower Lignitic: that of Black Butte, the whole Colorado Basin as far south into New Mexico as the Placière anthracite coal has its flora Eocene: Lower Eocene for America. 2. The Evanston coal is half Eocene, half Miocene, referred as yet to the Upper Eocene. 3. The flora of Carbon is Middle Miocene. 4. That of Green River, Elko Station, and the Parks is of Upper Miocene type. G. A. L.

Loew, O. Lieutenant Wheeler's Expedition nach Neu-Mexiko und Arizona. [Wheeler's expedition to New Mexico and Arizona.] Petermann's Mittheilungen, Bd. xx. pp. 401–416, 453–461, map [*not* geological].

Account of the results of the expedition, chiefly geographical, but with occasional geological notes.

Martin, D. S. Cretaceous in Long Island. Proc. Lyc. Nat. Hist. N. York, ser. 2, no. 4, p. 127.

Remarks confirming Prof. Hitchcock's belief in the presence of beds of this age in Long Island.

Marvine, A. R. Position and General Geology of the Gold-Hill Mining region. Amer. Journ. ser. 3, vol. viii. pp. 29–33 (with sketch map).

This paper is an Appendix to that of Prof. Silliman on Tellurium ores of Colorado. The Gold-Hill Mining region is not far from the great continental "divide," which has here a height of 13,000 feet. This, formed of Archæan and metamorphic rocks, is covered on the flanks by red beds, probably Triassic, which are followed by the upturned edges of Jurassic and Cretaceous beds, with the Lignite group (of disputed Cretaceous or Eocene age). The Archæan schists and granites are pierced by many dykes of felsite-porphyry, with which the Tellurium ores are connected. E. B. T.

Meek, Prof. F. B. On the age of the Lignitic formation of the Rocky-Mountain Region. Amer. Journ. ser. 3, vol. viii. pp. 459–463.

This article is an abstract of the writer's discussion of this subject in Hayden's Report of the Geol. Survey of the Territories for 1872.

Miller, S. A. Position of the Cincinnati Group in the Geological Column of Fossiliferous Rocks of North America. Cincin. Quart. Journ. Sci. vol. i. pp. 97–115.

Contains a review of the various subdivisions of the Silurian series, as developed in different portions of the North American area, with special references to the position of the "Cincinnati group." H. A. N.

Newberry, Prof. J. S. Circles of Deposition in American Sedimentary Rocks. Proc. Amer. Assoc. vol. xxii. B. pp. 185–196.

Dr. Newberry's views may be illustrated by the following arrangement:—A. Retreating sea (mixed sediment): Hudson, Helderberg and Hamilton groups, Coal Measures. B. Open sea (organic): Trenton, Niagara and Corniferous groups, Carboniferous Limestone. C. Off shore (mixed deposit): Calciferous, Clinton, Schoharie and Waverly groups. D. Shore (mechanical): Potsdam, Medina, Oriskany, and Erie groups. G. A. L.

——. On circles of Deposition in Secondary Sedimentary Rocks, American and foreign. Proc. Lyc. Nat. Hist. N. York, ser. 2, no. 4, pp. 122–124 (abstract).

Application of the writer's views (see before) to the succession of Cretaceous beds between the Colorado River and the eastern part of Kansas and Texas. Everywhere in that region the lowest member is a sandstone or conglomerate; then comes a great limestone rich in marine fossils, next a double series first of limestones and then of clays, shales, and mixed sediments. In the discussion following the paper Prof. Wurtz suggested for the three types of formations the names Siliceous, Calcareous, and Aluminous. Prof. Newberry prefers the terms Mechanical, Organic, and Mixed. G. A. L.

——. On the Linton Coal-bed and Fauna. Proc. Lyc. Nat. Hist. N. York, ser. 2, no. 4, pp. 134, 135.

Remarks suggested by Prof. Cope's 'Catalogue of Air-breathing Vertebrates from the Coal Measures of Linton, Ohio.' The course of events in the formation of this anomalous coal-seam is explained. G. A. L.

Newberry, Prof. J. S. On the Structure and Origin of the Great Lakes. Proc. Lyc. Nat. Hist. N. York, ser. 2, no. 4, pp. 136-138.

With the exception of Lake Superior all the great North-American lake-basins are excavated out of nearly horizontal strata. The proof is conclusive that each of these basins has been filled, and at least partly excavated by ice descending from the Canadian Eozoic highlands. G. A. L.

——. On the Parallelism of Coal-seams. Amer. Journ. ser. 3, vol. vii. pp. 367-369.

Argues against the views that the subsidence of coal-areas was always continental and general, and that the seams are necessarily parallel: instances cases of seams separated by varying intervals of beds. E. B. T.

——. On the Lignites and Plant-Beds of Western America. Amer. Journ. ser. 3, vol. vii. pp. 399-404.

The writer states that all the Lignite-beds of New Mexico (referred to the Eocene by Prof. Lesquereux) are unmistakably of Cretaceous age. He believes Prof. Lesquereux is likewise wrong in assigning an Eocene origin to the Colorado Lignites, which Profs. Meek, Marsh, Cope, and Stevenson consider to be Upper Cretaceous. The Upper Missouri Lignites, considered as Lower Eocene by Prof. Lesquereux, he regards as Miocene. The coals of Vancouver's Island have been stated to be of Tertiary age; he says that the evidence that they are Cretaceous is overwhelming. G. A. L.

Newberry, Prof. J. S. [and Profs. E. Orton, E. B. Andrews, and N. H. Winchell]. Report of the Geological Survey of Ohio. Vol. ii. Geology and Palæontology. Part i. Geology, pp. 701, with numerous maps and sections. Columbus.

Treats of the physical geology of a large portion of the State. The first chapter (xxx.), by Prof. Newberry, contains an account of the surface-geology of Ohio—the chief subjects treated of being the general glacial phenomena of the State, the boundaries of the glaciated areas, buried channels, the order and succession of the Drift-deposits, and the characters and distribution of the various members of the series; the mode of formation of the "Erie Clay," boulders, kames, draining of the inland sea, terraces and beaches, origin of the lake-ridges, causes of the Arctic climate of the glacial period, cause and manner of the motion in glaciers, drift-gold, and the origin of the great lakes.

Chapter xxxi., by Prof. Newberry, is concerned with the composition, extent, and subdivision of the great Carboniferous formation of Ohio. This embodies all the more important facts regarding the Carboniferous rocks of Ohio, comprising the Waverley Sandstone, the Lower Carboniferous Limestone, and the Coal Measures. Chapter xxxii., by Prof. Newberry, treats of the geology of Erie County and of the islands in Lake Erie which belong to Ohio, which give some interesting examples of glacial action. Chapter xxxiii., also by Dr. Newberry, is a report on the geology of Lorain County.

Chapters xxxiv.–xlix. are by Mr. N. H. Winchell, and treat in detail of the geology of sixteen counties.

Chapter l. by Mr. E. B. Andrews, gives an account of the Surface-geology of South-eastern Ohio; and the same observer contributes the following six chapters on the local geology of as many counties. Finally, Prof. Edward Orton contributes three chapters on the geological structure of Pike, Ross, and Greene Counties.

The work is illustrated throughout with coloured geological maps of the counties, sections, and sketch maps. H. A. N.

Newton, H. On American Iron Ores suitable for the manufacture of Steel. Proc. Lyc. Nat. Hist. N. York, ser. 2, no. 4, pp. 94–96.

Abstract only. Will be printed in full in the Annals, vol. xi. no. 3.

Osgood, Alfred. "Lead Mine" at Rocky Hill, West Newbury. Bull. Essex Inst. pp. 142, 143.

Pankhurst, E. A. On the Cañons of the Colorado. 21st Ann. Rep. Brighton Nat. Hist. Soc. pp. 55, 56.

Pesse, —. Le district minier de Caracoles. [The mining district of Caracoles, Bolivia.] Bull. Soc. géog. Paris, 6 sér. t. vii. p. 177. Notice in Ocean Highways, p. 43.

About 100 miles inland from the port of Cohija silver-mines have been discovered which are of great promise; the present annual outturn is £300,000, the working cost about £40,000. F. D.

Purves, Dr. J. C. Esquisse stratigraphique et espèces fossiles de l'île d'Antigua. [Stratigraphical sketch and fossil species of Antigua.] Ann. Soc. Mal. Belg. t. viii. Bull. des Séances, pp. xxv–xxviii.

Divides the formations of the island into six principal groups:—1. Masses of various igneous rocks forming the highest part of the island at its S.W. end. 2. A long series of unfossiliferous tuffs, clays, and conglomerates. 3. Very fossiliferous siliceous beds (land, fresh- and brackish-water shells, &c.). 4. Series similar to 2. 5. A thick formation of limestones and calcareous clays and sand, forming a third of the island (corals, marine shells, &c.). 6. A calcareous series lying unconformably on the last, and containing land, freshwater, and marine forms of species now living on the island and in the surrounding sea. Generic list from siliceous beds given. G. A. L.

Raymond, R. W. The Geographical Distribution of Mining Districts in the United States. Trans. Amer. Inst. Min. Eng. vol. i. pp. 33–39.

Richardson, J. Wonders of the Yellowstone region in the Rocky Mountains, &c. 8vo. pp. 271, 2 maps, many illustrations. London.

Geological matter in reference to the geysers, hot springs, cañons, and other natural phenomena of the district.

Romanes, G. Anthracite Coal-Mining in Pennsylvania. Coll. Guard. vol. xxvii. p. 574.

A paper read at a meeting of the Edinburgh and Leith Engineers' Society. There are three very large anthracite coal-fields in Pennsylvania—the Schuylkyl, the Middle, and the Wyoming and Lackawanna. The seams worked are from 4 to 20 feet in thickness. The mode of working is described, and the commercial aspects of the subject are discussed. G. A. L.

Schickendantz, D. F. Estudios sobre la formacion de los Salinas. [Formation of the Salt-plains.] Bol. Acad. Nac. Cordova, pt. iii.

With analysis of the salt.

Selwyn, R. A. C. (and others). Report of Progress of the Geological Survey of Canada for 1873–74. Pp. 268. 8vo. Montreal.

This volume comprises various reports of work done in connexion with the Canadian Geological Survey, which, under its extended field of operations, gives rise to much work, of necessity more in the way of reconnaissance than of a detailed description of particular areas. The headings are:—

The Report on Operations in Manitoba with the Diamond-pointed Steam Drill, by W. B. Waud, pp. 12–16.

Observations in the North-west Territory, from Fort Garry to Rocky-Mountain House, by R. A. C. Selwyn, pp. 17–62.

Memorandum on Western Coals, Iron-ore, &c., by Dr. B. J. Harrington, pp. 63–65.

Report on the Country between Red River and the South Saskatchewan, by R. Bell, mainly a lignite Tertiary area, pp. 66–93, with analyses by C. Hoffmann.

Report on Geological Explorations in British Columbia [Vancouver's Island], by James Richardson (pp. 94–102), which describes the extension of the Cretaceous coal-bearing rocks, and, what is of more interest, the discovery of fossils in limestones associated with the highly altered green slates forming the older rocks of the island, which are probably Carboniferous. There is also information as to iron-ores and coal from the main land; but much of this is given in the reports of other parties.

Report of Explorations in Frontenac, Leeds, and Lanark Counties, with notes on the Plumbago and Apatite of Ottawa County, by H. G. Vennor (pp. 103–146). A detailed account of all the workings that have been carried on in the Apatite-deposits of the Laurentian limestones, some portions of which are illustrated by a map.

Reports on the Springhill Coal-Field, by S. Barlow (pp. 147–160), on the Coal-Field of Cumberland County, by W. McOuatt (pp. 161–170), and of Explorations in Cape Breton, by C. Robb (pp. 171–191), are detailed examinations of parts of the Coal-field of Nova Scotia, and contain details of the seams and mines worked, with chemical examitions of the coal by C. Hoffmann.

Notes on the Iron Ores of Canada and their Development, by Dr. B. J. **Harrington** (pp. 192–259), contains some additional information to that in the earlier report on the same subject, by Dr. Sterry Hunt; but the subject has been so completely treated previously, as to leave little room for a second report. Indeed many analyses of Dr. Hunt's have been reprinted to illustrate the subject. The details of the different furnaces at work in Canada and Nova Scotia are of considerable interest. In the introductory summary Mr. Selwyn calls attention to the discovery of a new carbonate containing alumina in combination to the amount of 30 per cent., a fact of great interest; but the detailed examination is not given.

The final Report is palæontological (see Whiteaves, *post*). H. B.

Simonin, L. De Washington à San Francisco, à travers le continent américain. [From Washington to San Francisco, across the American Continent.] Le Tour du Monde, vol. xxvii. pp. 161–240. Paris.

Contains some geological and mining information.

Stevenson, J. J. Account of the Lignites of Colorado. Proc. Lyc. Nat. Hist. N. York, ser. 2, no. 4, pp. 93, 94.

Abstract. The age of the lignites is said to be Upper Cretaceous. The account is a record of observations made in 1873, with the Expedition of Lieutenant Wheeler.

Tenney, Sanborn. The Quartzite of Williamstown and the Structure of the Graylock Range. Proc. Amer. Assoc. vol. xxii. B. pp. 37–41.

Says that there is no reasonable doubt that the slates of the Taconic range dip under the great Limestone belt at its eastern base. "The main mass of the Graylock range appears like one vast monoclinal." The quartzite of Williamstown is said to pass gradually into limestone, although at Stone Hill the latter is found dipping under the former. Full of local details. G. A. L.

Vanden Broeck, Ernest. Rapport sur un mémoire de M. G. F. Matthew intitulé: Notes on the Mollusca of the Post-Pliocene Formation in Acadia. [Report on a paper by Mr. G. F. Matthew, entitled, &c.] Proc.-verb. Soc. Mal. Belg. t. iii. pp. clv–clxiii.

A summary of the Acadian Post-Pliocene deposits is given as follows, in ascending order:—1. *Boulder Clay.* Depression of 2500 to 1000 feet; fauna meagre, arctic in character. 2. *Syrtinsian Beds.* Depression of 1000 to 500 feet; fauna probably very scarce: intense marine currents. 3. *Lower Leda Clay.* Upper part, depression of 500 to 200 feet; lower part, of 200 to 100 feet: in the older beds some deep-sea forms; in the upper great development of marine life.—4. *Upper Leda Clay.* Depression of 100 to 60 feet: life less abundant than in the lower groups. 5. *Saxicava Sand.* Depression 60 to 40 feet and less: littoral fauna. G. A. L.

Wheeler, Lieut. G. M. Progress-Report upon Geographical and Geological Explorations and Surveys west of the 100th Meridian in 1872. Washington.

Notes of work in geology. A notice in Amer. Journ. ser. 3, vol. vii. pp. 388–391, gives an account of the *personnel*, organization, areas surveyed, and proposed publications of the Survey.

Willcox, J. Glacial markings and Granite Boulders in St. Lawrence County, N. Y. Apatite in Laurentian rocks on north shore of Rideau Lake, in Burgess. Proc. Ac. Nat. Sci. Philadel. p. 275.

Winchell, N. H. The Devonian Limestones of Ohio. Proc. Amer. Assoc. vol. xxii. B. pp. 100–104.

The section of these beds exposed in the valleys of the Scioto and Olentangy rivers, Delaware County, Central Ohio, is as follows:—1. A hard siliceous Limestone: no fossils; 4 to 9 feet. 2. A blue argillaceous Limestone: *Spirifer mucronatus, Cyrtis Hamiltonensis, Cyrtoceras undulatum*; 35–40 feet. 3. A saccharoidal or crinoidal Limestone: many Brachiopods (Delhi beds); 38 feet. 4. A light-coloured Magnesian Limestone: very few fossils; 27 feet. 5. A sandy Limestone passing into a quartzose sandstone and into a conglomerate; no fossils; 2 to 10 feet. All these Limestones, except 5, form the "Corniferous" group of Dr. Newberry, by whom the last is regarded as the equivalent of the "Oriskany" of New York and the base of the Devonian. 1 is believed to be the representative of the Tully Limestone of New York; 2 has been called Upper Corniferous, but is believed to be the equivalent of the Hamilton of New York; 3 is the exact equivalent of the Corniferous Limestone of New York; 4 represents the Onondaga Limestone of New York. It is thus shown that the Hamilton group, in passing through Ohio, maintains a full development as a member of the Devonian, and does not thin out. G. A. L.

——. Geological Notes from Early Explorers in the Minnesota Valley. Bull. Minnesota Ac. Nat. Sci. pp. 89–101.

Notices the works of Le Sueur, Carver, Keating, Featherstonhaugh, Nicollet, Shumard, and Hall, ranging from about 1695 to 1865.

Wolf, T. Geognostische Mittheilungen aus Ecuador. [Geology of Ecuador.] N. Jahrb. Heft iv. pp. 377–398.

Three essays:—1, on the occurrence of quartz-andesite in the highlands of Quito; 2, geological sketches of the Province of Guayaquil; 3, on a mud-volcano on the west coast of Ecuador. F. W. R.

5. *ASIA.*

Anon. A new Volcano east of Japan. Geogr. Mag., July, p. 146.

The captain of the steamship 'Harwich' reports a large volcano, not marked on any of the charts, in N. lat. 31° 31', E. long. 140° 14'.

Baber, Consul. Coal-mining in China. Coll. Guard. vol. xxvii. p. 171.

The information refers especially to the districts of Tamsuy and Kelung. The coal-producing districts are:—1. Coal Valley, close to Kelung; 2. Coal Harbour, three or four miles distant; and 3. Nuan-Nuan, about seven miles off. The volcanic region N. of the Tamsuy river is said to abound in coal. Coal on the surface is known to the Chinese over an area of 500 square miles. The mode of working is described, the prospect of extension of the mining is discussed, and information as to the price is given. G. A. L., F. D.

Ball, V. A new Locality for Copper in the Narbada Valley. Rec. Geol. Surv. Ind. vol. vii. part 2, pp. 62, 63.

Mr. Maynard discovered a deposit of copper on an island in the Narbada river, near Birman Ghát. The ore is diffused through a thickness of at least 6 feet (and probably more) of schist and quartzite of the Bijour series; it also occurs in nests. At the top are azurite and malachite; lower down, grey and red ore. F. D.

——. On the Building and Ornamental Stones of India. Rec. Geol. Surv. Ind. vol. vii. part 3, pp. 98–122.

This is a statement of the areas in which the several kinds of stone used in building are found, accompanied by an account of examples of their use in various ages. The materials are described under ten classes, as in Prof. Hull's work. Many references are given to previous writings, also a list of remarkable monoliths in India. F. D.

——. Geological Notes on the country of the Luni Pathans, S.E. corner of Afghanistan. Rec. Geol. Surv. Ind. vol. vii. part 4, pp. 145–158, with map.

The following series was passed over in the route from Dera Ghazi Khan to the Chamarlang valley:—*a*, alluvium; *b*, sandstones and conglomerates (? Pliocene); *c*, sandstones and clays (? Miocene); *d*, nummulitic limestones; *e*, sandstones and shales. A list of fossils from the nummulitic limestones is given. At the top of *e* a little coal occurs, a total of 2 feet distributed in nine thin layers through 100 feet of shale. F. D.

Barbot de Marny, N. N. Jahrb. Heft v. pp. 524–526.

Letter explaining the proposed operations of two expeditions—the one to study the area between the Caspian and Aral Seas, the second

to study the basin of the Amou river. Levellings will be made to determine the difference of level between the Caspian and the Aral.
F. W. R.

Bauerman, H. Report on the Iron Ores of India. Supplement to the Gazette of India, Aug. 22, 1874, pp. 1457–9, for Preliminary Report, and pp. 1494–6, for Further Report.

In the Preliminary Report to the Government of India the characters of ores from the following localities are described:—1. Raneegunge coal-field, clay iron-ores; 2. Karunpoora coal-field, south of Hazareebagh, clay iron-ores; 3. Nerbudda valley, north of Gurrawara, brown iron-ore; Lohara, north-east of Chandah, massive hæmatite; 5. Yenak, in Berar, hæmatitic sandstone and conglomerate; 6. Dechourie and Kaleedoongee, in Kumaon, pisolitic hæmatite; 7. Ramgurh and Khyrna, in Kumaon, specular and massive hæmatite. Many considerations bearing on the question of the practicability of establishing remunerative iron-smelting works are discussed.

In the Further Report partial analyses of some of the ores are given; and the conclusion is drawn that iron-works might be established in the Raneegunge district, to work at a profit during the prevalence of high prices in England. Also the iron-ores of Chanda are promising, if they can be brought into communication with the Chanda and Berar coal-fields.
F. D.

Beke, Dr. C. T. On the True Position and Physical Characters of Mount Sinai. Rep. Brit. Assoc. for 1873, Sections, pp. 161, 162.

Refers to the differences of opinion which have been held as to the identification of Mount Sinai: thinks the cause of this uncertainty is obvious, believing that the mountain is not in the peninsula of Sinai. Gives evidence that this mountain is really a volcano, now extinct, situated within the Harra Radjlâ, a region of igneous origin, on the west side of the Arabian desert. At the time of the Exodus Mount Sinai was in a state of eruption, the smoke and flame from its crater being described by the sacred historian as "by day a pillar of cloud, and by night a pillar of fire." The volcano was not extinct in the time of Elijah, six centuries later.
W. T.

Belt, T. The Steppes of Siberia. Quart. Journ. Geol. Soc. vol. xxx. pp. 490–498, 4 woodcuts.

After describing the beds of which the Steppes are formed, and giving detailed sections, the author advances the theory that there was a damming up of the drainage of the country by an overflow of polar ice, and a consequent formation of a vast lake, in which was deposited the material of the Steppes.
G. A. L.

Blanford, W. T. On some Evidence of Glacial Action in Tropical India in Palæozoic (or the oldest Mesozoic) times. Rep. Brit. Assoc. for 1873, Sections, p. 76.

Describes the occurrence of scratched boulders in fine shales at the base of the Talchir group, the lowest member of the great series of plant-bearing rocks, for which the name of Gondwana series has been suggested. The exact age of these beds is doubtful; but they are pre-Triassic. Dr. Oldham has observed the rock on which the boulder-bed rests to be polished and grooved. It is inferred that these boulders, many of which have come from a distance, were carried by ice. W. T.

BLANFORD, W. T. On the Physical Geography of the Deserts of Persia and Central Asia. Rep. Brit. Assoc. for 1873, Sections, pp. 162, 163.

The deserts of Persia consist of vast plains of Alluvium, usually much longer than broad. Along the borders of the deserts are remarkable slopes of coarse gravel, probably washed down from the surrounding hills. It is likely that the alluvial desert-plains have been formed in lakes when the rainfall was greater than now. The rain which now falls is mostly evaporated or absorbed; but the streams from the hills end in lakes, all but two of which are salt. None of the valleys has any outlet to the sea. It is supposed that the outlets were closed by the elevation of ranges of hills in the later Tertiary period. W. T.

CAMPBELL, J. F. On Polar Glaciation, &c. Quart. Journ. Geol. Soc. vol. xxx. p. 450. (See *post.*)

In this paper are some remarks on subaerial denudation and on glaciation in the Caucasus.

CARPENTER, Dr. W. B. On the Physical Geography of the Caspian Sea, in its relations to Geology. Rep. Brit. Assoc. for 1873, Sections, pp. 165–167.

Gives an account of the recent report of Prof. von Baer. The Caspian is from 2000 to 3000 feet deep at its southern end; the central part, on the Caucasian side, is also deep; but the northern part nowhere exceeds 50 feet in depth. The Caspian is 80 feet below the level of the Black Sea. There is abundant evidence that it formerly spread over a larger area than now, having been reduced to its present dimensions by the excess of evaporation over supply. It would be expected that the water would be salt; but it has only one half the saltness of the water of the Black Sea, and only one fourth of that of the Mediterranean. Prof. von Baer has shown that this result is due to the drawing off of the water into lateral bays, where it rapidly evaporates. The largest bay is the Karaboghaz, which communicates with the Caspian only by a channel 150 yards wide and 5 feet deep; through this a constant current of water runs from the Caspian into the bay, at the rate of three miles an hour. This bay alone receives 350,000 tons of salt a day; the water evaporates, and the salt remains behind. The constant draining off of the salt water into these great natural salt-pans, and the constant supply of fresh water by the rivers, accounts for the comparative freshness of the Caspian Sea. W. T.

David, Armand. Géologie de la Chine. [Geology of China.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 406, 407.

An abstract of a letter, in which the writer describes the coal-bearing beds of the mountain of Lean-Chan.

Drew, F. The Upper Indus Basin. Geol. Mag. dec. 2, vol. i. p. 94.

Referring to a letter, by Col. Greenwood, on this subject (see p. 134), the writer, while admitting Col. Greenwood's "hard-gorge-and-soft-valley" theory generally, does not see how it accounts for the formation of great thicknesses of alluvial beds in the gorge as well as in the wide valleys. F. D.

Everwijn, R. Verslag van eene Onderzoekingsreis, in het rijk van Siak. Jaarb. Mijnw. Ned. Oost-Ind. 3 Jaar., 1 Deel, pp. 83–155, with map.

Describes a journey through Siak, on the east coast of Sumatra. Geological observations are recorded, and a list of borings for tin-ore is given. The map, on a scale of $\frac{1}{450,000}$, shows the course of the rivers Siak and Kampar, and is partly coloured geologically. F. W. R.

——. Iets over aardolie in de residentie Cheribon op Java. Jaarb. Mijnw. Ned. Oost-Ind. 3 Jaar., 1 Deel, pp. 167–171.

Notes the results of several borings for petroleum in Cheribon, Java.

Fischer, Paul. Sur les roches fossilifères de Léan-Chan (Shensi méridional) envoyées par M. l'Abbé A. David. [Fossiliferous Rocks of Lean-Chan (S. Shensi).] Bull. Soc. Géol. France, 3 sér. t. ii. p. 409.

Short descriptions of five rock-specimens, showing fossils apparently of Silurian (Wenlock), Carboniferous, Tertiary, and Quaternary age.

Foote, R. B. The Auriferous Rocks of the Dambal Hills, Dharwar District. Rec. Geol. Surv. Ind. vol. vii. part 4, pp. 133–142, with map.

The main hill of the range is in E. long. 75° 45′ and N. lat. 15° 13′; the rock is of the great gneiss formation of S. India, of granitoid gneiss and various sorts of schists, much disturbed. Quartz-reefs occur in all these rocks; but from one only did the author succeed in obtaining gold. This reef was 5 feet thick on the average, and half a mile long, direction N. by W., dip easterly, 40° to 50°, of ordinary dirty-white quartz, in parts ferruginous. It seems to contain but a small proportion of gold. Even if the reefs were moderately auriferous, miners would have many difficulties; no fuel is near, and water is generally scarce. Alluvial gold is washed from the stream-deposits derived from the hill-tract; the process of washing practised by the natives is described, and their plan of selecting wash-dirt. Very small quantities of gold are obtained. The paper concludes with a notice of other auriferous localities in the Dharwar, Belgaum, and Kuladgee districts. F. D.

Fras, Oscar. [Geology of Palestine.] N. Jahrb. Heft iv. pp. 410–412.

Letter announcing contributions to the Stuttgart Museum from Herr Zeller, a missionary at Nazareth. Specimens from Mount Osha, north of Es Salt, contain fossils of Cenomanian (Lower Chalk) age. The red iron-shot sandstone, known as "Nubian Sandstone," appears to be not older than the Lower Chalk. F. W. R.

Godwin-Austen, Major H. H. On the Gāro Hills. Journ. R. Geogr. Soc. vol. xliii. [Published in 1874, though dated 1873.]

At the end of this paper there is a "geological appendix," pp. 42–46. The rocks of the district are gneiss, on which rests a considerable thickness of Cretaceous rocks capped by Nummulitic Limestone and later Tertiary sandstone, also amygdaloid trap (the Sylhet trap of Medlicott). The secondary beds consist chiefly of sandstones with seams of coal, some 10 feet thick. Many local details are given. G. A. L.

Gore, J. E. Note on a bed of Fossiliferous "Kunkur" in the Punjab.

Three feet below the surface of the ground, in a six-inch bed of soft limestone, are shells, chiefly of the genera *Planorbis* and *Limnæus.*

Greenwood, Col. The Upper Indus Basin. Geol. Mag. dec. 2, vol. i. p. 45.

Refers to a memoir by Mr. Drew (Quart. Journ. Geol. Soc. vol. xxix. p. 441) on the subject, and suggests that the alternation of gorges with alluvial flats depends on the different hardness of the rocks, and maintains that this is enough to account for the consecutive accumulation and denudation of alluvium. (See Drew, p. 133.) F. D.

Hodges, Prof. On the Composition of Tea and Tea-soils from Cachar. Chem. News, vol. xxx. no. 771, pp. 114–116.

Gives chemical composition of the soil and subsoil from the field on which the tea had been grown.

Hughes, T. W. H. Notes on some of the Iron Ores of Kumaon. Rec. Geol. Surv. Ind. vol. vii. pt. 1, pp. 15–20. See also Supplement to Gazette of India, Aug. 22, pp. 1466–68.

The extent of the beds of iron-ore and of limestone and their quality are discussed with a view to settle the question of the advisability of re-establishing iron-works in Kumaon. F. D.

——. Note on the raw materials for Iron-smelting in the Raneegunge field. Rec. Geol. Surv. Ind. vol. vii. pt. 5, pp. 20-30. See also Suppl. Gazette of India, Aug. 22, pp. 1474–81.

Some analyses of the Raneegunge coal are given; and a comparison of it is made with English coals. A short account of the iron-ore beds of the district is given; and then follows a discussion of the question whether the impure limestone called "Kunker" will do for a flux, which, with some limitations, is answered in the affirmative. Estimates of cost are also set down. F. D.

HUGHES, T. W. H. Petroleum in Assam. Rec. Geol. Surv. Ind. vol. vii. pt. 2, pp. 55–58.

At Makoom, in N. lat. 27° 18′ and E. long. 95° 40′, eight borings were put down for oil, which was struck in each case, in one at a depth of 118 feet. Several hundred gallons a day were drawn; the undertaking failed only from the difficulty of transport. A distillation-analysis of a sample is given, and a comparison of it with Pennsylvanian and Rangoon oils. F. D.

——. Second Note on the Materials for Iron Manufacture in the the Rániganj Coal-field. Rec. Geol. Surv. Ind. vol. vii. pt. 3, pp. 122–124.

Many additional analyses of iron-ore and of "Kunkur" are given, and some further remarks on the subject of iron-manufacture. F. D.

——. Manganese ore in the Wardha Coal-field. Rec. Geol. Surv. Ind. vol. vii. pt. 3, pp. 125, 126.

The ore occurs in botryoidal masses in the red clays of the Kámthi series around Malágarh Hill. An analysis gave 44·6 per cent. of manganese; the mineral seems to be psilomelane. F. D.

——. Note on some of the Iron-deposits of Chāndā, Central Provinces. Supplement to Gazette of India, Aug. 22, pp. 1489–1491.

The ore is chiefly hæmatite, but magnetic oxide and brown iron-ore also occur. An analysis of the hæmatite is given. Some localities are particularized. The native method of smelting is described. F. D.

KING, W. Geological investigation in the Godávari District. Rec. Geol. Surv. Ind. vol. vii. pt. 4, pp. 154–160.

The following groups of rocks are found, in descending order:—1. Recent; 2. Cuddalore sandstones; 3. Deccan trap with intertrappeans; 4. Lametas; 5. Rajmahals; 6. Damūdas (including (*a*) Kamthis, (*b*) Barakars, in which coal occurs); 7. Crystallines. F. D.

LYMAN, B. S. Preliminary Report of the first season's work of the Geological Survey of Yesso. 46 pp. 8vo. Tokei. Reprinted in Coll. Guard. vol. xxviii. pp. 25, 51, 96, 122.

The part of Yesso surveyed contains the following groups of rocks:—Alluvium, new and old; volcanic pebble-rocks, which seem to be the result of the wearing away of volcanic rocks by water; volcanic rocks; rocks of the Toshibets-Karafto system of folds; coal-bearing rocks, or rocks of the Horumui-Kuril system of folds (Tertiary?); rocks of the Horumui-Karafto system of folds; rocks of the Toshibets-Kuril system of folds. The coal-fields are those of Kayanoma, Horumui, Kudow. Besides coal, the useful minerals in the area surveyed are iron, sand, sulphur, limestone, gold, rock-tar, mineral waters, and traces of silver, lead, zinc, manganese, and copper. F. D.

Mallet, F. R. Geology of Dárjíling and Western Duárs. Mem. Geol. Surv. Ind. vol. xi. pt. 1, pp. 96, 2 maps.

Begins with a geographical description of the Dárjíling district and a general sketch of the rocks. A section from south to north gives the *primâ facie* appearance of a great synclinal; but this, as regards the outer (Tertiary) rocks, is deceptive. North of the Tertiaries is a narrow band of the Damúdas, which include beds of anthracite. Overlying these, without apparent unconformity, are some thousand feet of slates. Ascending the hills, the slates pass through mica-schist to gneiss; the relation of these groups of rocks to each other is obscure. Then follows a detailed description of the different series of rocks. The Damúdas have been much crushed, and in places metamorphosed; the crushing has also caused the thickness of the coal-beds to vary much within a few yards. A detailed section of more than 1800 feet of these beds is given. The Baxa series is then described; it consists of some thousand feet of slates, schist, quartzite, and dolomite; these are largely developed in the W. Duárs, but only occur in the extreme E. end of the Dárjíling territory. Since they occupy different areas, the relation of the Damúda and Baxa series is not clear. Next comes an account of the Dáling slates, which rest conformably on the Damúdas; these slates, again, *dip under* gneiss, which is called "Dárjíling gneiss." Next are the Tertiaries which fringe the older rocks; they are many thousand feet in thickness; along one part of the edge of the hills, however, they are absent, probably from denudation. The latter part of the Memoir is devoted to Economic Geology. Several outcrops of coal have been measured (of how many seams one cannot tell), which show a thickness varying from 2 to 11 feet. The dip is generally high. Assays show 70 per cent. of free carbon from one locality and 66 per cent. from another; the coal is very flaky; the prospects of mining it are discussed. Iron-ore occurs in some places; copper also is found, and the native mode of mining and smelting it is described. F. D.

——. Geological Notes on N. Hazáribágh. Rec. Geol. Surv. Ind. vol. vii. pt. 1, pp. 32–44, plate.

Describes the area in two sheets of the Survey Map. The rocks (chiefly metamorphic) are carefully described. Gneiss occupies a portion of the area; with this occurs a band of dolomitic limestone. Mica-schist and quartzite overlie the gneiss, but no distinct unconformity has been observed in this area; hornblende rock and schist also occur. Pegmatite (defined as a coarse mixture of quartz, felspar, and silvery mica, often containing tourmaline) occurs through both the gneiss and the schists, penetrating them in dykes and veins, and occasionally occurring in isolated lenses; contact-sections of the granite and schists are shown in the plate. Trap-dykes were also observed. In one locality sandstone with pebbles, 20 feet thick, probably belonging to the Tálchír group, was seen.

The occurrence of various minerals is noticed. Galena is sparsely disseminated through some of the rocks. Tin-stone and magnetic iron have been found in the gneiss, and worked on a small scale. In the pegmatite, mica has been mined; the plates of it commonly brought to the market are from 6 inches to a foot across; the largest plate the author saw was 20 inches by 17. F. D.

Markham, C. R. Statement exhibiting the Moral and Material Progress and Condition of India during the year 1872–73. (Parl. Report.) Fol., Lond. Pp. xviii, 236, 16 maps.

An enlarged and revised edition of the Report issued in 1873. The information relating to Physical Geography or Geology occurs under the following heads:—Agriculture (including meteorology), pp. 32–48; Irrigation, pp. 49–74; Communications, pp. 75–89; Forests, pp. 90–100; Minerals, pp. 101–106; Surveys, pp. 195–199. W. T.

Medlicott, H. B. Note on habitat of Elastic Sandstone. Rec. Geol. Surv. Ind. vol. vii. pt. 1, pp. 30, 31.

This account is from the observations of Col. MacMahon. The flexible sandstone occurs in patches or nests in a nearly vertical bed of quartzite which is used for millstones. There is no regular bed of it; it seems to be a local peculiarity of the sandstone-rock caused by percolation of rain-water from the surface. The formation is Vindhyan; the locality is Kaliana, five miles W. from Dadri, and sixty miles W. from Delhi. F. D.

——. Notes from the Eastern Himalaya. Rec. Geol. Surv. Ind. vol. vii. pt. 2, pp. 53, 54.

A notice of the discovery by Mr. Mallet of a band of Damuda Coal-measures between the Tertiary sandstones and the schists of the Sikkim Himalayas. There is no marked stratigraphical break between these Coal-measures and the slaty and schistose rocks of the mountains. F. D.

——. Coal in the Garo Hills. Rec. Geol. Surv. Ind. vol. vii. pt. 2, pp. 58–62.

The coal (Cretaceous) occurs by the river Semsang and some of its tributaries. The outcrop of a 7-foot bed was observed; it is a light coal, brown, but an excellent fuel. The author concludes that there is a coal-field of considerable extent. The probability of more coal being found in other basins not far off is discussed. F. D.

Meissner, —. Die Naphta-Quellen bei Mendeli in Irak Arabi. [Naphtha springs near Mendeli, Irak Arabi.] Petermann's Mittheilungen, Bd. xxx. pp. 343-346, 4 figs. in text.

A description of the beds from which the naphtha is collected is given. The springs apparently rise along the axis of an anticlinal, and are associated with gas-discharges. The mode of working the springs is given, and some information as to their produce. G. A. L.

Munroe, Henry S. Geological Survey of Hokkaido: Yesso Coals. 39 pp. 12mo. Tokei. A Report.

Ness, Walter. On the Warora Coal-field [Central Provinces, India]. Coll. Guard. vol. xxviii. p. 745.

A letter describing the coal-bearing rocks of the district. The section from above downwards seems to be:—1. Black cotton-soil, 6–10 feet; 2. Yellowish clay with concretionary nodules, called "kunker;" 3. Soft sandstone, 150 feet; 4. Carbonized shale, a few feet; 5. Coal, varying from 29 to 50 feet; 6. Soft white sandstone, several hundred feet in thickness. This basin, the writer estimates, will yield 20 million tons of coal. Analyses are given. G. A. L.

[The same coal, as well as some iron-ore, is mentioned in a communication by Mr. Ness in Journ. Soc. Arts, vol. xxii. p. 780.]

Noguès, A. F. Oscillations of the Nummulitic Sea. See p. 85.

Oldham, Dr. [T.] Coal-Fields of British India. Rep. Rugby-School Nat.-Hist. Soc. for 1873, pp. 45–54.

The lowest formation in India is gneiss, with trap-dykes of great length. This is succeeded by the schistose and quartzitic "Kuddapa" rocks, above which an unconformity occurs; and the overlying rocks have various local names. Above these comes the Vindhyan series (sandstones with limestones and clays), of great thickness and area, probably of Old Red age and of freshwater or estuarine origin. There is then another unconformity; and the succeeding thick series of sandstones and shales is marked by the occurrence of terrestrial plants. The lowest part of this "plant-bearing series" is the Talcheer beds, consisting of fine silt with large blocks of rocks from distant localities, which have been transported by ice, as some show glacial polishing and scratching. To the Talcheer beds succeed the Damuda beds (10,000 feet thick), which contain all the productive coal, and consist of ironstone-shales, sandstones, and coals, the last varying up to 35 feet in thickness. Westward the coal-bearing rocks change in character, some divisions dying out, and the coal being concentrated in a few thick beds. The coal-fields are in basins, largely owing to original limitations of deposit, and not merely to denudation. They are in groups related to the great drainage-courses, which seem to have been marked out at the time of the deposit of the coal-bearing beds. All the coals consist of fine layers of vegetable matter and silt, and are less mineralized than most English coals; their age has been wrongly given as Oolitic and Carboniferous (plants being the only fossils); but, from the probable Triassic age of certain overlying beds, they may be partly Permian and partly Carboniferous. W. W.

Ravenstein, E. G. Formosa. Geogr. Mag., Oct. pp. 292–297, with map.

It is mentioned that the mountains are probably of volcanic origin; but sedimentary rocks, including slates, limestone, and sandstone, are also met with. Active volcanoes are not known; but solfataras occur. Coal has been found in several parts; 75,000 tons were raised in 1872: it is a lignite. Sulphur exists near the coal-mines; petroleum also occurs. F. D.

Renaud, G. P. A. Rapport van het district Soengeiselan, eiland Bangka. Jaarb. Mijnw. Ned. Oost-Ind. 3 Jaar., 1 Deel, pp. 3–82, chromo-lith. map.

Report on the district of Soengeiselan in the Island of Banca, with first sheet of a geological map. Cap. 1 describes the physical geography of the district; cap. 2 gives a geological and mineralogical sketch, noting occurrence of tin, bismuth, gold, iron, manganese, and pyrites; cap. 3 describes occurrence of tin-ore in the river-valleys. Statistics of production of tin from 1850 to 1872 are given. F. W. R.

Richthofen, Baron von. The Loess of Northern China, and its relation to the salt-basins of Central Asia. Rep. Brit. Assoc. for 1873, Sections, p. 86 (abstract).

This loess is an unstratified yellow earth; it covers an area of 240,000 square miles, spreading over ground from the level of the sea to 8000 feet above, its thickness varying from very little to upwards of 1500 feet. The author thinks it can neither be a freshwater nor a marine deposit, but *subaërial*, being partly deposited by the wash of rain and partly carried by winds. F. D.

——. On a Coral reef on the coast of Java. See p. 92.

Schmick, J. H. Die Aralo-Kaspi-Niederung und ihre Befunde im Lichte der Lehre von den säkularen Schwankungen des Seespiegels und der Wärmezonen. [The Aralo-Caspian lowland, with reference to the doctrine of the secular oscillations of the sea-level and of zones of temperature.] 125 pp., 1 plate. 8vo. Leipzig.

Stiffe, Lieut. A. W. On the Mud-craters and Geological Structure of the Mekran coast. Quart. Journ. Geol. Soc. vol. **xxx**. pp. 50–53, map and section.

This coast extends from the head of the Persian Gulf to the W. boundary of India. Heavy rains sometimes fall for a short time in winter, filling the large watercourses; but at other seasons, and sometimes for two whole years, the district is rainless. The hills rise to about 2000 feet; they consist of clay alternating with, and capped by, calcareous beds, some shells from which are believed by Mr. Etheridge to be Miocene. The beds are generally flat, or only slightly inclined, but at the E. and W. ends of the district have a high dip.

The author gives notes of two hot springs on the coast, and an account of the denudation of the country.

The Mud-craters extend along the coast for about 200 miles, within a few miles of the shore. They are conical hills of clay, with truncated tops, from 20 to 400 feet above the plain. The largest one ascended was about 100 feet wide at top, and resembled a cup filled with liquid mud, which occasionally overflowed. Sometimes an ebullition of gas took place, but there was no heat evolved. The mud (analyzed by Mr. Ward) consists mainly of carbonate of lime with some quartz-sand. The water contains common salt and a little sulphate of lime. These craters are most active at spring-tides. The author thinks they may be caused by hydrostatic pressure, and unconnected with volcanic action, of which this coast affords no trace. There is reason to believe that similar craters exist under the sea, but near the shore. The clay formation forms the bed of the sea for some miles from shore, the depth of water increasing gradually to about 30 fathoms, and then suddenly to 300 or 400 fathoms. This precipitous edge the author believes to have once been a sea-cliff. It is probable that the land afterwards sank below its present level; for lithodomous perforations are found in the clay considerably above the sea-level. W. T.

Stiffe, Lieut. A. W. The Island of Hormúz (Ormuz). Geogr. Mag. vol. i. pp. 12–17, map.

The greater part of the island is probably of volcanic origin, consisting chiefly of rock-salt; and there are hills of a grey trachytic rock. At the S.E. corner there are some stratified rocks.

Stoliczka, Dr. F. Structure of the Hill-ranges between the Indus valley in Ladak and Shah-i-Dula. Rec. Geol. Surv. Ind. vol. vii. pt. 1, pp. 12–15.

South of the Indus near Leh are Eocene sandstones and shales; north of the Indus is a ridge of syenitic gneiss; this passes (northwards) into syenite and chlorite schist, with a more massive chloritic rock; so to the Changchenmo valley. These schistose and chloritic rocks the author considers to represent the Silurian formation. North of that valley are dark shales and sandstones, which extend to the boundary of Lingzithang, which the author thinks to be Carboniferous. In places along the bank of the Changchenmo river this is overlain by Triassic limestone, also found in the hills N. of Lingzithang and in the upper Karakash valley. At Kizil-jilga is dark slate, which continues down the Karakash river as far as the bend; these slates are probably Silurian, corresponding to the schists on the S. side of the ranges. F. D.

——. Geological Notes on the Route traversed by the Yarkund Embassy from Shahidulla to Yarkund and Kashgar. Rec. Geol. Surv. Ind. vol. vii. pt. 2, pp. 49–51; and Quart. Journ. Geol. Soc. vol. xxx. pp. 571–573.

Metamorphic rocks (gneiss and schist) occur from the Karakash river to near Iám, north of the Sanju Pass; then black slates rest unconformably on the schists, and are overlain by grey sandstone and conglomerate. By Kiwaz there is conglomerate resting on Carboniferous Limestone, which again rests on chloritic schist. At Sanju red sandstone is overlain by calcareous sandstone and marl (Middle Cretaceous).

Along the edge of the great desert, beds of gravel, sand, and clay, some like the "loess" of the Rhine, occur. The author concludes that this "loess" is a subaerial deposit. F. D.

Stoliczka, Dr. F. On the Occurrence of Jade in the Karakash valley. Rec. Geol. Surv. Ind. vol. vii. pt. 2, pp. 51–53; and Quart. Journ. Geol. Soc. vol. xxx. pp. 568–570.

On the S. slope of the Kuenlun range, above the right bank of the Karakash river, are the old jade-mines—shallow holes or low galleries. A gneissic or a schistose rock is traversed by veins of a white, apparently zeolitic, mineral; this, again, is traversed by veins of jade; the jade also occurs in nests; the colours are white, pale green, and green. F. D.

——. Geological Obsevations made on a visit to the Chaderkul, Thian-Shan Range. Rec. Geol. Surv. Ind. vol. vii. pt. 3, pp. 81–85; and Quart. Journ. Geol. Soc. vol. xxx. pp. 574–580.

North from Kashgar the first hills met were a 400-feet ridge of beds of sand and clay, which the author calls "Artush beds;" these continue in the next range of hills, covered unconformably by gravel beds. Further in is the Kokan range; it has at its base green and purple shales overlain by dark limestone. Five miles north of Chungterek were found, in a thick bed of limestone, Triassic fossils. Near Chakmák bedded dolerite occurs, in some places columnar; and the former position of the cone of eruption was noticed. To the north rises the Terektagh to 16,000 or 17,000 feet, composed of Tertiary conglomerate, dolomitic limestone, slaty rocks (changing into schist), and another dark limestone; dip N. by W., very high. Then follows a sketch of the later history of the hill-ranges before described. F. D.

——. Note on Pamir Khurd. Rec. Geol. Surv. Ind. vol. vii. pt. 3, p. 86.

From Yangihissar to Sirikul and across Pamir Khurd there are no rocks younger than Trias. Pamir Khurd proper is gneiss and schist; it is not an elevated plain, but a mere valley two or three miles wide. From the hills on the south glaciers come down almost into the valley. F. D.

Theobald, W. On the former extension of Glaciers within the Kangra District. Rec. Geol. Surv. Ind. vol. vii. pt. 3, pp. 86–98, map.

From the Dháoladhár range into the Kángra valley, down to an average level of 2000 feet, sinuous streams of boulders are traceable; many of these boulders are rugged and angular, over 50 feet in diameter. Reaching the lower open ground the streams expand. The boulders are chiefly of gneiss; in the lower portions waterworn stones are found mixed up. These deposits are described in several localities; and the former presence of glaciers in several of the valleys is inferred and their course laid down. The theory of glacial conditions is discussed, and a conclusion drawn that before the deposition of the Sivalik group the whole Himalayan area was 12,000 or 15,000 feet higher than now. The paper is succeeded by a short criticism by the Editor. F. D.

Theobald, W. Remarks on certain considerations adduced by Falconer in support of the antiquity of the Human race in India. Rec. Geol. Surv. Ind. vol. vii. pt. 4, pp. 142–145.

This refers, first, to an argnment of Dr. Falconer's that the idea of a gigantic tortoise in Hindu mythology may have originated in a traditional aquaintance with *Colossochelys atlas* of the Sivâlik fauna. Mr. Theobald maintains that the force of this argument is weakened by later discoveries having shown that *Colossochelys* belongs to the older Náhan fauna, it being less likely that man will be proved to have been contemporary with that than with the Sivâlik. Secondly comes a criticism on Falconer's inference that the extinct *Hippopotamus palæindicus* was the original of the Sanskrit "jala hasti," or water-elephant. Mr. Theobald brings philological authority to show that the word is as likely to mean "shark;" but he himself inclines to believe that the animal thus named is the dugong found in the Bay of Bengal, and that the argument drawn from it will not support the inference of the coexistence of man with the extinct animals named. F. D.

Tietze, Dr. E. Geologische Notizen aus Persien. [Geological Notes from Persia.] Verh. k.-k. geol. Reichs. pp. 53–55, 77–79, 318, 319, 360–363, 377–380.

Describes certain geological phenomena noticed in a visit to Persia.

Verbeek, O. Eerste Verslag over een onderzoek naar kolen op het eiland Nias. Jaarb. Mijnw. Ned. Oost-Ind., 3 Jaar., 1 Deel, pp. 157–163; 2 maps and 1 section.

Report on examination of coal-deposits in the island of Nias, on the west coast of Sumatra. The coal occurs in marl, probably of Miocene age; but the seams are too poor to be worked. The marls are covered by limestone. F. W. R.

Wynne, A. B. Observations on some features in the Physical Geology of the Outer Himalayan region of the Upper Punjab, India. Quart. Journ. Geol. Soc. vol. xxx. pp. 61–80, map and 6 sections.

The crystalline and schistose rocks found far in among the hills are succeeded by slates and limestones, which are unconformably overlain by Triassic rocks; these, again, are unconformably succeeded by Jurassic, Cretaceous, and Nummulitic beds (each also unconformable). The author calls the beds from the Trias to the older Tertiary "hill limestones;" outside of these is a tract occupied by an enormous thickness of sandstones and clays of later age. The extension of this outer zone, and the character of its contact with that within, are then described in detail. A Table, correlating the strata as described by different observers from the Salt range to the Sutlej, is given. F. D.

Wynne, A. B. Geology of the neighbourhood of Mari, Punjab. Rec. Geol. Surv. Ind. vol. vii. pt. 2, pp. 64–74, map and plate.

West of the Jhilam river the strike of the rocks forming the Outer Himalayas is no longer north-westerly, as it is further east, but varies from west to north. At Mari the rocks are of grey sandstone and purplish clay, more than 5000 feet thick; these pass up into soft light-grey sandstones alternating with rusty orange clays, which again are succeeded by conglomerates. Inwards the rocks dip north-westerly, and *appear* to go under rocks which are relatively older, and of which a considerable proportion is limestone. These older rocks are of Nummulitic, Jurassic, and Triassic age. The structure is greatly confused by contortion, inversion, and faulting. Details of several localities are given, with a sketch map of twenty or thirty square miles and a section across. F. D.

Yule, H. Geographical Notes on the basins of the Oxus and the Zarafshán (from the papers of the late A. Fedchenko). Geogr. Mag., June, pp. 49, 53.

Among these notes there is one of gaseous exhalations from a mountain called Kántágh in the Kohistán of the Zarafshán. Gases escape from fissures, and are of so high a temperature that they set fire to wood; sulphur is deposited from them; coal crops out near. There is also a note on localities of salt-mines in the basin of the Oxus:—1. Altinin Dara, on the S. of Alaï; 2. Near Norak on the Surkháb; 3. In the mountains near Huzar or Guzar. F. D.

6. *AFRICA.*

Bleicher, —. Recherches sur l'origine des éléments lithologiques des terrains tertiaires et quaternaires des environs d'Oran. [Origin of the Lithological Elements of the Tertiary Rocks of the Oran District (Algeria).] Compt. Rend. t. lxxviii. pp. 700–702.

The writer's conclusions are:—that the middle Tertiary was especially characterized by trachytic eruptions, which were submarine; that at the same epoch enormous quantities of silica were ejected. The elements of the Pliocene rocks are generally of detritic origin. The activity of thermal springs and volcanic phenomena reached its height during the older Quaternary period; and to this period is referred the far-spreading gypseous conglomerate, which covers the Secondary and Tertiary rocks. To the accumulations of iron in veins and otherwise in the district the author assigns a hydrothermal origin, as he also does to the gypseous conglomerate. G. A. L.

——. Sur la géologie des régions comprises entre Tanger, El-Araich et Meknès (Maroc). [Geology of the country between Tangiers, El-Arish and Meknes, Morocco.] Compt. Rend. t. lxxviii. pp. 1712–1716.

The following formations were recognized:—*Post Tertiary*: Cave-deposits, with flint implements and recent shells; Travertins, with plant-remains. *Tertiary*: Pliocene, grits and conglomerates, with shells; Miocene (S. of Tangiers), gritty marls and foliated yellow marls, with fossils; Eocene, schistose marls and grits, calcareous and siliceous grits, cropping out in many localities, Nummulitic deposits. *Secondary*: Cretaceous, marly shales, thin limestones, *Globigerina*-chalk, &c.; Jurassic, thick limestones and dolomites: this is the oldest rock determined. G. A. L.

——. Note sur la Géologie et la Paléontologie des Formations d'estuaire de l'étage tertiaire supérieur aux environs d'Oran. [Geology and Palæontology of the Estuarine Upper Tertiary Formations near Oran (Algeria)]. Compt. Rend. t. lxxix. pp. 252–255.

A detailed description of four sections through these beds, with lists of the fossils obtained in them. The conclusions arrived at are:—1. That in this region the Mediterranean coast-line was very different in Pliocene times from what it is now; 2. That the plateau extending to the east of Djebel Santo, and reaching a height of 144 metres, was in Pliocene times covered by the sea and by fresh water, the latter belonging to a river, of which the estuary is to be found between Oran and Tlemcen; 3. That the Pliocene fauna consisted of land-shells, probably now extinct, and of a great majority of living species. The horse was represented by the present species. G. A. L.

COHEN, E. Geognostisch-petrographische Skizzen aus Süd-Africa. [Geology of S. Africa.] N. Jahrb. Heft v. pp. 460–505, plate.

Refers to the immediate neighbourhood of Capetown. There are chapters on the granite, the diabase, the slate-rocks, and the sandstone formation; and descriptions are given of the Lion's Rump, Sea Point, and Platte Klip. F. W. R.

——. [Geology of the African Diamond Fields.] N. Jahrb. Heft v. pp. 514, 515.

Letter claiming priority for views in Mr. Dunn's paper (see *post*).

COOPER, G. C. On the Origin and Present Position of the Diamonds of South Africa. Proc. Geol. Assoc. vol. iii. no 8, pp. 336–343, 2 figs. (sections).

Argues against the igneous origin of the diamond-bearing deposits, and maintains that the diamonds and associated minerals have been transported by water. F. W. R.

CORA, G. Le regioni aurifere tra Limpopo e Zambesi. [The Gold regions between the Limpopo and the Zambesi.] Cosmos di Guido Cora, vol. ii. pp. 20–27, map.

COSSON, E. Note sur le projet d'établissement d'une mer intérieure en Algérie. [Proposed inland sea in Algeria.] Compt. Rend. t. lxxix. pp. 435–442.

Raises the following objections to the proposal:—1. The Blad-el-Djerid and the Oued-Rir would be submerged or incrusted with salt; 2. The amount of salt in the superficial and underground waters of the Eastern Sahara would be increased; 3. A great climatal change would possibly occur in that region, which is the principal centre of the date-culture. G. A. L.

DASTAGUE, —. Hauts Plateaux et Sahara de l'Algérie occidentale. [High Plateaux and Sahara of Western Algeria.] Bull. Soc. Géogr. France, 6 sér. t. vii. pp. 113, 229.

FUCHS, EDM. Note sur l'isthme de Gabès et l'extrémité orientale de la dépression saharienne. [Isthmus of Gabez and the Eastern extremity of the Sahara depression.] Compt. Rend. t. lxxix. p. 352.

Shows that the depression in question was never any thing but a salt lake, unconnected with the Mediterranean in historical times. The author believes that when this lake existed the climate was very different and more humid than now, and does not believe in the practicability of the proposed inland sea. G. A. L.

LENZ, Dr. OSKAR. Ankunft in der Corisco-Bai und Excursion nach Gabun. Geologische Notizen von der West-Küste von Africa. [Arrival in the Bay of Corisco, and Excursion to Gaboon. Geological Notes on the West Coast of Africa.] Verh. k.-k. geol. Reichs. pp. 287–289.

——. Excursion von Gabun aus, den Comofluss aufwärts.

[Excursion from Gaboon up the River Como.] Verh. k.-k. geol. Reichs. pp. 319–321.

Lenz, Dr. Oskar. Reisen in West-Afrika. [Journeys in West Africa.] Verh. k.-k. geol. Reichs. pp. 363, 364.

Lesseps, Ferdinand de. Communication sur les lacs amers de l'isthme de Suez. [Bitter Lakes of Suez.] Compt. Rend. t. lxxviii. pp. 1740–1748.

Shows that eleven centuries ago the mean level of the Red Sea was about three metres higher than now, and that then the rising of the land had been going on for a long time. Describes the great bed of salt in the middle of the great basin of the Bitter Lakes, which consists of a number of horizontal beds of salt, from 8 to 10 centimetres thick, divided by thin films of sand. Each bed of salt, in the author's opinion, represents the time which elapsed (after the obstruction of the two branches of the ancient canal of communication mentioned by Herodotus) between each exceptionally high tide of the Red Sea, when the influx of comparatively fresh water for a time stopped the formation of the deposits. Tables are given showing the evaporation going on in the Bitter Lakes, the velocity of the currents in the Suez Canal, the area and capacity of the lakes, and the volume of the salt-beds. G. A. L.

Maupas, E. Note sur la moraine terminale d'un ancien glacier trouvée dans le ravin de l'Oued El-Kébir (Blida). [Terminal Moraine of an old Glacier in the Ravine of Oued El-Kébir.] Bull. Soc. Clim. Alger.

Maw, George. Geological Notes on a Journey from Algiers to the Sahara. Quart. Journ. Geol. Soc. vol. xxx. pp. 105–122, pl. ix. and 5 figs.

The rocks noticed are:—1. Micaceous schists and gneiss; 2. Rocks of the Lower Atlas, age unknown, but underlying Neocomian beds; 3. Sandstones of Guelt-el-Stel and Sidi Makhelouf (Triassic?); 4. Saliferous Marls (Keuper?); 5. Red and green marls (age?); 6. Grey marls of Hauts Plateaux (age?); 7. Fossiliferous beds of L'Aghouat, Miocene; 8. Tertiary Beds of the Tell and Algiers; 9. Post-Tertiary deposits. The author gives a summary of his views as to the succession of events and changes of level. G. A. L.

Milne, John. Geological Notes from the Neighbourhood of Cairo. Geol. Mag. dec. 2, vol. i. pp. 353–362, 3 figs. in text.

Written to accompany some specimens now in the British Museum. The rubbish-mounds outside Cairo are noticed, as well as the great Moccattam quarries in Nummulitic limestone, with a N.E. dip beneath the red quartzose hills. The general succession of the beds from the summit of the hills behind the citadel is given, with notes on the red quartzose range of Jebel Achmar and on the geological features of the road leading to the so-called "Petrified Forest." G. A. L.

Pomel, A. Sur la prétendue mer Saharienne. [The alleged Saharan sea.] Compt. Rend. t. lxxix. pp. 792–794.

Asserts that in his work on the Sahara (1872) he sufficiently proved the non-existence of an old Sahara sea. By his reading of the word λίμνη, he now argues against the existence in historical times of the *lacus Tritonis* of Herodotus. Does not believe that the formation of an inland sea in the Tunisian "Chotts" would materially alter the climate of the Desert. G. A. L.

Renevier, Prof. E. Renseignements géographiques et géologiques sur le Sud de l'Afrique. [Geographical and geological notes on S. Africa.] Bull. Soc. Vaud. Sci. Nat. vol. xiii. pp. 384–390.

A communication extracted from letters of M. P. Berthoud. The geological notes relate to gold-deposits at Maraba-Stad (Transvaal). The quartz-rock is described as a bed dipping 50°; the mines are only lately begun: one shaft is being sunk along the dip of the quartz, and another vertically, to intersect it; the latter cuts a second bed of quartz. Prof. Renevier remarks that the description of the quartz is one of beds, and not of veins. E. B. T.

Roudaire, E. Réponse à la Note précédente de M. Houyvet, sur le projet de rétablissement d'une mer intérieure en Algérie. [The Scheme of re-establishing an inland sea in Algeria.] Compt. Rend. t. lxxix. pp. 289, 290.

Argues that the effects of evaporation on the proposed inland sea would be counteracted by an outflowing undercurrent, which would form itself as soon as communication is established with the Mediterranean. G. A. L.

——. Note sur la mer intérieure d'Algérie. [The inland Algerian Sea.] Compt. Rend. t. lxxix. pp. 501–504.

An answer to the objections to the proposed scheme raised by Messrs. Fuchs and Gosson (see p. 145). G. A. L

Shepstone, Hon. T. Remarks on the Geographical and Physical Character of the Diamond Fields of South Africa. Journ. Soc. Arts, vol. xxii. pp. 390–392.

The author thinks that the great basin of S. Africa suggests the idea of vast and violent water-action in the past; that it was once the bed of an inland sea, which has become dry by the upheaval of portions from time to time. There are also signs of extensive igneous action. It is in this basin that diamonds are found. Thinks that diamonds were formed when carbonic acid was ejected by subterranean heat through fissures into water of depth enough to liquefy the gas, which then was decomposed and lost its oxygen. The discussion follows at p. 396. W. W.

Stow, G. W. Geological Notes upon Griqualand West. Quart. Journ. Geol. Soc. vol. xxx. pp. 581–680, plates xxxv.–xxxix. (maps and sections), 7 woodcuts.

From the Modder river, S.W. and then W., to the junction of the Vaal and Orange, the olive-coloured shales of the *Dicynodon* or Karoo series, traversed frequently by igneous rocks, form the country, and are seen in some places to lie unconformably on older rocks. The shales reach to the edge of the Campbell Randt, on the other side of the Orange river, and have been formed, to a great extent, of the débris of those old hills. The oldest rocks of the locality crop out here and there in the gorges at the foot of the Randt, and are metamorphic rocks, greatly denuded, on which the extensive siliceo-calcareous beds of the Great Campbell Plateau lie unconformably. These last and the breccias of their slopes are covered with enormous travertine-deposits. Beyond the Plateau, at Griquatown, a long parallel range of jaspideous rocks comes out from beneath the Campbell Plateau, and presents a group of yellow, brown, chocolate-coloured, and red jaspers, with magnetic and other ironstone, and seams of blue and yellow crocidolite. The southern part of this range has long been known as the "Asbestos Mountains" and the "Doornberg." Igneous rock-masses occur around Ongeluk, west of the Jasper range; and then bright-red jasper-rocks crop up near Matsáp, succeeded to the west by the parallel quartzite-range of Matsáp, and again by other bedded jaspers, which seem to lie in a synclinal of the quartzite-rocks, which come up again in the Langeberg. These are succeeded by lower rocks, consisting largely of sandstone, grit, and quartzite, with more or less mica, also parallel to the former ranges. The maximum thickness of the successive beds is 24,000 feet; allowing for possible reduplications, the minimum is not less than 9000 feet. The details of stratification, successive upheavals, denudation, nature and origin of the salt-pans, escarpments, river-valleys, and other features are treated of. T. R. J.

Vélain, Ch. Constitution géologique des îles voisines du littoral de l'Afrique, du Maroc à la Tunisie. [Geology of the Islands off the Coast of Marocco and Tunis.] Compt. Rend. t. lxxviii. pp. 70–74.

Lafarine Islands: three small islands, mainly formed of granitoid trachyte. In part the islands are covered by reddish travertines, with land-shells. These tuffs are well developed on the mainland, thus affording a means of determining approximately the date of the severance of the islands from the continent. *Rachsgoün Island* is composed of a grey compact basalt, with volcanic scoriæ and reddish pozzolana, which has been worked for hydraulic cement. Quaternary deposits, 100 feet thick, with land-shells of species now living in Algeria, are found at the southern end. *Habibas Isles*, very far from land: formed of eruptive rocks, chiefly siliceous trachytic porphyries, and peculiar green serpentine-rocks, besides some gypsiferous marls. *Plane Isle*: a mere rock formed of Marmorean Limestones and ferruginous Dolomites; these rocks are metamorphosed Jurassic. *La Galite Isles*, off the Tunisian coast: Trachytic rocks very analogous to the Andesites of Ecuador &c. Sedimentary rocks are found, but altered, and without fossils. Recent reddish calcareous tuffs, with land-shells, overlie most of the rocks. G. A. L.

Virlet d'Aoust, —. Observations sur l'ancienne mer intérieure du Sahara tuniso-algérien. [The old inland sea of the Tuniso-Algerine Sahara.] Compt. Rend. t. lxxix. pp. 794, 795.

The writer brings one of M. Elie de Beaumont's lines of upheaval to bear on the question of the modern separation between the ancient bay of Triton and the Mediterranean. G. A. L.

7. *AUSTRALASIA.*

Anon. Coal in Gipps Land. Coll. Guard. vol. xxvii. p. 576.

Note of the discovery and working of a 2-foot seam at Kilcunda.

——. [? Dr. **Hector.**] Colonial Museum and Geological Survey of New Zealand. Ninth Ann. Rep. on the Museum and Laboratory.

Under "*Palæontology*" (p. 5) a few new geological conclusions are noticed. Many analyses are given under "Laboratory." (See *post.*)

——. The Mineral Wealth of Queensland. Coll. Guard. vol. xxvii. p. 757.

Sketch of the mineral resources, especially as regards iron.

——. The Geology in Silver's 'Handbook for Australia and New Zealand,' pp. 21–28. 8vo. Lond.

——. Mining Prospects in Australia; and Mining in Australia. Iron, vol. iii. pp. 262, 616.

——. The Gold and Tin of Australia; and Gold Mining in Victoria. Iron, vol. iii. p. 556, and vol. iv. p. 203.

Bonwick, J. The Mineral Resources of Australia. Iron, vols. iii., iv. pp. 67, 98, 101, 163, 227, 258, 291, 421, 514, 546.

A series of articles:—Iron in Queensland; Iron in W. Australia; Copper in Queensland; Peak-Downs Copper Mine; Tasmanian Tin; Iron in S. Australia; N. Coal-fields of Tasmania; S. Coal-fields of Tasmania; Mineral Resources of Australia, Tin; Coal in Victoria.
R. E., Jun.

Crawford, J. C. Port Nicholson an Ancient Freshwater Lake. Trans. N. Zealand Inst. vi. pp. 290–294.

The land in this part was probably never more than about 15 feet lower than now; but during the depression of the Tertiaries it was raised 5000 to 6000 feet, when the islands of N. Zealand were perhaps united. Many facts lead to the conclusion that Port Nicholson was a lake. Borings show remains of land vegetation at a considerable depth. The entrance to the harbour is such as to forbid the idea that it was caused by the ebb and flow of the tide; but it can be accounted for on the above supposition, at the same time possessing an outlet in Evans Bay. If the entrance were closed, Port Nicholson would revert to its supposed former state. The formation of the lake is ascribed to a glacier, which once filled the valley of the Hutt. R. E., Jun.

Dobson, A. D. Notes on the Glacial Period. Trans. N. Zealand Inst. vi. pp. 294–297.

The last, greatest glacial extension arose from elevation, whilst subsidence caused the termination of the glacial period, in the Province of Nelson. At the end of the Pliocene period the Middle Island was represented by a group of islands, the sea standing at an elevation of 2000 feet higher than now. The gravel-drifts, which cover a large part of the level lands, and cap all the older formations from Nelson to Hokitika, were formed at this time, in addition to the great gravel-drift of the Canterbury Plains. The moraine-matter of the W. coast is of greater extent, and much thicker than that of the E. coast, always overlies the shingle-drift, and shows no sign of subsequent marine action or of having been under water. A few raised beaches are to be met with on the W. coast, at heights varying from 50 to 300 feet above the sea-level, and were probably formed during the period of elevation. The author's theory is:—"That the glacial period commenced during a period of elevation, during which many of the existing raised beaches and auriferous leads were formed; that continued subsidence followed the close of the glacial period, and that subsidence is still going on." R. E., Jun.

Etheridge, R. Jun., and R. A. F. **Murray**. Report on the Durham Lead, Buninyong, Victoria. Reports Mining Surveyors and Registrars, 30th June. App. B. pp. 42–50. Melbourne.

Written in 1868, though not published until 1874. Describes an area to the south of the township of Buninyong, comprised within three quarter-sheets of the former Geological Survey of Victoria, through a part of which passes the "Durham Lead." The formations treated of are the Silurian, a marine series referred to the Miocene, drifts referred to the Pliocene, and several Basaltic lava-flows filling in the old channel of the Yarrowee or Leigh River, and spreading over the older formations of the surrounding country. The Pliocene drifts are subdivided into:—*a*, those forming "cappings" on older rocks; *b*, those filling-in old valleys, forming "leads;" and, *c*, those forming widely spread surface "washes." The drifts which occupy the old bed of the Leigh River, and form the Durham Lead, are referable to *b*. Of the Basaltic lava-flows three are traceable to their points of eruption —Mount Mercer, the Green Hill, and Hardie's Hill. R. E., Jun.

Haast, Dr. J. Notes on the Geology of the Clent-Hills and Mount-Somers Districts, in the Province of Canterbury. Reports of Geological Explorations during 1872–3; Geol. Surv. N. Zealand, pp. 1–19 (with map and sections), 8vo. Wellington.

There seems to be in the Clent-Hills district an older sedimentary series of shales, slates, conglomerates, and sandstones, the last with plants (*Pecopteris*, *Camptopteris*, *Tæniopteris*, *Cycadites*?, &c.). At Mount Potts the lower part of the Clent-Hills section is represented by a great thickness of clay-slates, with a few beds of conglomerate, containing rounded fragments of bones and broken shells. Both the shells and the plants from the plant-beds of the Clent and Malvern Hills are considered to be allied to those of the coal-formation of New South Wales. Resting on the edges of the older sedimentary rocks is a series of basic volcanic rocks, melaphyres with interstratified tufas, in places covered by a series of quartziferous porphyries and pitchstones, the older basic series having been denuded before the accumulation of the acid series. Here and there the porphyries rest directly on Palæozoic

rocks. A younger sedimentary formation is represented by a few isolated brown-coal deposits. Two of these occur in depressions in the quartz-porphyry, whilst a third rests on the flanks of the older sedimentary formation in the Lake-Huron Plains. Concludes with the description of a limestone unconnected with the Brown-coal series, but only the remains of a formation of Middle Tertiary age which once covered an extent of low country, but now, owing to the action of glaciers and to fluviatile denudation, is much restricted.
R. E., Jun.

HAAST, Dr. J. Notes to accompany a Geological Map and Sections of the Shag-Point District, Province of Otago. Reports of Geological Explorations during 1872–3; Geol. Surv. N. Zealand, pp. 19-26 (with map and sections). 8vo. Wellington.

The Shag-Point Coal Measures (Cretaceous) occur in a thick series of beds of littoral origin, termed the "Older Conglomerate" or "Shag-Point Series." The lower part consists of shales and conglomerates, with small seams of pitch-coal, the last increasing in thickness and importance in the upper part of the formation. From certain shales, sandstones, and iron-stones, dicotyledonous leaves, ferns, and a few conifers have been obtained. After these beds had been subjected to much subaërial and littoral denudation, depression took place, and the "Younger Conglomerate and Septaria Formation," consisting of conglomerates and ferruginous sandstone, altering to Septaria clays, was deposited; with the lower beds of this series are a few seams of brown coal. The Septaria formation is overlain by a great thickness of greensand-beds, becoming glauconitic, and during the deposition of which basalt-eruptions took place: these are called the "Greensands and Basalt Group," and are again overlain by a "Calcareous Series," consisting of sandy clays with bands of calcareous rock containing *Crassatella, Scalaria, Pectunculus laticostatus*, &c. In the valley of the Shag occurs a series of small hills of micaceous sandy shale, probably of lacustrine or estuarine origin. R. E., Jun.

——. Researches and Excavations carried on in and near the Moa-bone-Point Cave, Sumner Road, Banks Peninsula, in the Year 1872. Pp. 21. 8vo. Christchurch, N. Z. Phil. Inst. Canterbury, N. Z. (Sept. 1874.)

The cave is in dolerite lava: its entrance is 13·64 feet above high-water mark, whilst the floor of the innermost of the three chambers is only 8 feet above that level. In the first and largest chamber the chief excavations were made, of which the following section is a general example:—1. Beds of European occupation; 2. Ash-bed with pieces of flax &c., indicating Maori occupation; 3. Shell-beds with species now living in the neighbouring estuary; 4. Ash-beds with Moa-bones; 5. Agglomerate of fallen pieces of the roof; 6. Another ash-bed with Moa-bones; 7. Marine sands with large stones blackened and split by fire, probably the remains of an "oven" of the old Moa-hunting population, and near which were obtained fragments of *Dinornis*-eggs, pieces of "fire-sticks," &c. The history of the cave appears to have been:—1. Partial filling with marine sands, containing driftwood, blocks of stone, &c.; 2. After partial exclusion of the sea the old Moa-hunters used it as a cooking-place, giving rise to the accumulation of the ash- and dirt-beds; 3. After the retreat of the sea the agglomerate was accumulated, and the cave was also occasionally inhabited; 4. A more regular occupancy by the Moa-hunters when the "dirt-bed" was formed, containing bones, polished-stone implements, and other articles; 5. A long period of non-habitation; 6. Formation of shell-bed without Moa-bones, but with thin beds of ashes, denoting occasional occupancy, the upper portion of the shell-bed being perhaps referable to the forefathers of the present Maori tribe. Dr. Haast concludes that the extinction of the gigantic birds of New Zealand is thrown back for a considerable space of time. R. E., Jun.

Hann, W. Narrative of an Exploring Expedition in Northern Queensland, Australia. Proc. Roy. Geogr. Soc. xviii. pp. 87–107.

Geological information is scattered throughout. Between the Walsh river and the Mitchell a fossiliferous limestone was met with, like that of the Flinders and Barcoo rivers of W. and S. Queensland. The upward course of the Mitchell was followed for some distance, and a range of hills discovered, pronounced by Mr. N. Taylor, Geologist to the Expedition, to be Carboniferous, in somewhere about lat. 16° 16′ 59″ S. Gold was found on the Palmer river about twenty-nine miles north of the Mitchell; and the auriferous indications were found to exist for some distance up the steam. R. E., Jun.

Hector, Dr. J. Report on Samples of Stone from the Tokatea Tunnel. Trans. N. Zealand Inst. vi. pp. 402–404.

——. Reports and Evidence on the Coal-Fields of New Zealand. Appendix to the Journal of the House of Representatives. In continuation of previous Reports.

——. President's Anniversary Address to the Wellington Philosophical Society, 1873. Trans. N. Zealand Inst. vi. pp. 367–376.

Treats of glacier-action in New Zealand, of Moa-deposits, of the origin of the fauna, and of Pleistocene changes.

Howorth, H. H. Recent Changes in the Southern Circumpolar Region. Journ. Roy. Geogr. Soc. xliv. pp. 252–262.

Refers to the writings of various authors respecting the gradual elevation of the coasts of Australia, Tasmania, and New Zealand.

Hutton, Capt. F. W. Table of the Sedimentary Rocks of New Zealand. Geol. Mag. dec. 2, vol. i. p. 515.

Gives the succession of formations, noting their probable ages as compared with European classifications. The characteristic fossils of each formation are mentioned. Contemporaneous eruptive rocks occur in all excepting the M. Jurassic, Triassic, and Palæozoic; coal occurs in the U. Miocene, U. Eocene, U. Cretaceous, and M. Jurassic. W. T.

HUTTON, Capt. F. W. On the Geological Structure of the Thames Gold Fields. Trans. New Zealand Inst. vi. pp. 272–283.

The country around Shortland consists almost entirely of trachyte-tufa resting unconformably on Palæozoic rocks; it is traversed by dykes of dolerite, melaphyre, and timazite, and by auriferous quartz-veins. In the Tapu district the quartz-veins occur both in the Palæozoic slates and in the trachyte-tufa, but chiefly in the latter. At Coromandel the veins are all in the tufa. Prof. Hochstetter considers that the gold was derived only from the Palæozoic slates, whilst Dr. Hector contends that it occurs neither in the slates nor in the tufa, but in an older volcanic formation between the two, and which has partaken in the movements of the Palæozoic slates. Capt. Hutton denies the existence of this intermediate volcanic formation, considering it part of the trachytic tufa, and regards the gold as derived from the latter.

The results of the survey of the Thames gold-fields are:—1. That no line of separation can be drawn showing the existence of two volcanic formations separated from one another by a long period of time. 2. That the rock in which the auriferous veins are found does not run in nearly vertical bands, but is lying in its original (nearly horizontal) position. 3. That all the phenomena are consistent with the idea that the formation is one, the older portions forming the centre and the younger the outskirts. Seams of coal have been found at Coromandel, overlain by trachyte and trachytic agglomerate, which at one place contains gold. Both the trachytes and the dykes resemble the Miocene gold-bearing rocks of Hungary. Those of the Thames gold-fields are considered to be Oligocene, not older than the Wiatemata series.
R. E., Jun.

——. Report on the Geology of the North-east Portion of the S. Island, from Cook's Straits to the Rakaia. Reports of Geological Explorations during 1872–3; Geol. Surv. New Zealand, pp. 27–58 (with map and sections). 8vo. Wellington.

The geological features of a tract of 11,000 square miles are described. A band of Palæozoic rocks extends across from N.E. to S.W., forming mountain-ranges. It is divided into two conformable formations:—*Tuamarina Formation*, consisting of phyllites, quartzites, chlorite schist, sandstones with *Orthoceras* and *Phragmoceras* (?), and conglomerates. *Kaikoura Formation* with Annelide markings.

Flanking this Palæozoic band, both on the N.W. and S.E., is a series of Secondary deposits, viz. *Wairoa Formation* (U. Trias), with *Monotis salinaria*, &c. *Maitai Formation* (L. Jurassic), with interbedded volcanic rocks. *Putataka Formation* (M. Jurassic), with coal-seams and obscure plant remains. *Waipara Formation* (U. Cretaceous), in two divisions:—*a.* Ngarara group, with contemporaneous volcanic rocks and the coal-fields of the Malvern Hills; Saurian remains: *b.* Amuri Limestone group.

A Tertiary series flanks the Secondary, forming rolling downs. U. Secondary and Tertiary outliers are found in the valleys of the Palæozoic band. The Tertiary series is divided thus:—*Oamaru Formation*, not older than U. Eocene, in two conformable divisions—Ototara and Trelissic groups, the latter with contemporaneous volcanic rocks. *Ahuriri Formation* (L. Miocene), unconformable on the last. *Pareora Formation* (U. Miocene), divided on palæontological grounds into Kanieri group, with coals, and Awatere group, with contemporaneous volcanic rocks. *Glacier deposits* (Older Pliocene). *Post-glacial deposits.*

The author considers that the central part of the Canterbury Plains has risen 1700 feet since the beginning of the Pleistocene period.

R. E., Jun.

Johnston, R. M. Regarding the Composition and Extent of certain Tertiary Beds in and around Launceston. Monthly Notices Roy. Soc. Tasm. for 1873, pp. 39–48, sections and plates of fossils.

In this neighbourhood are vast horizontal accumulations of gravel, in layers from 1 to 3 feet thick, with laminated clays and tufaceous sands. The stones of the gravel are siliceous pebbles, gritty concretions, all more or less rounded and waterworn, opalized wood and waterworn fragments of three different kinds of limestone with Palæozoic fossils. Both the opalized wood and the waterworn pebbles show evidence of having undergone subsequent alteration by heat. The accumulation of this gravel is accounted for on the supposition that the drainage of the country was dammed up by a stream of lava during the later volcanic eruptions, or by dislocation, so converting the valley of the Tamar and the westward plains into a large lake. Many of the intercalated beds of clay contain leaves, branches, and twigs of plants and trees. The whole series is divided into:—*Lower Zone*, with a bed of Lignite resting unconformably upon greywacke on the West Tamar. From the absence of tufaceous sands it is inferred that this zone immediately preceded the later volcanic eruptions. *Middle Zone*, of shifting beds of clay and tufaceous sand deposited during the period of volcanic activity. *Upper Zone*, of alternating beds of conglomerate-breccia and gravel, and detritus of the lower zones, forming low rounded hills and terraces, flanking the present course of the river Tamar. R. E., Jun.

Liversidge, A. Note on the Bingera Diamond Fields, N. S. Wales. Proc. Roy. Soc. N. S. Wales.

——. On the Coal and Iron Deposits at Wallerawang, N. S. Wales. ? Proc. Roy. Soc. N. S. Wales.

Minard, —. Sur les Gisements d'Or des Philippines. [Gold Deposits of the Philippine Islands.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 403–406.

The Gold occurs both in Alluvium and in Quartz-reefs, that in the former being now alone worked. The principal rocks of the gold district are calcareous grits and conglomerates, sometimes capped by coralline limestones. *Platinum* and *Lead* are also found in the Alluvial deposits. G. A. L.

Murray, R. A. F. Special Report on the Freestone-Creek Deep Lead, near Briagolong. Reports of the Mining Surveyors and Registrars, Victoria. Quarter ending June 30, 1874. Pp. 41 (with plan). Melbourne.

The "Avon Sandstone" (U. Palæozoic) visible in the Freestone Creek, Gippsland, is unconformably overlain by a considerable extent of Tertiary gravels and clays of unknown depth, in which gold is reported to have been found in small quantities. It is uncertain whether the auriferous ground is a lead or merely the edge of the great Tertiary area. The Tertiary gravel is apparently composed of the débris of an U. Palæozoic conglomerate occurring at the Gladstone and Maximilian Creeks. R. E., Jun.

Nicholas, W. Special Report on the Geology of the Country between Tullarook and Longwood, on the North-eastern Railway, Victoria. Reports of the Mining Surveyors and Registrars, Victoria, March 31. Pp. 39, 40. Melbourne.

Between the townships of Tullarook and Longwood the North-eastern Railway runs over U. Palæozoic rocks, which may have been connected with similar rocks known to exist on the Wild-Duck Creek, near Heathcote. In a cutting near the township of Seymour fossils were obtained, one of which Prof. M'Coy thought might be Triassic. R. E., Jun.

Nowell, E. C. Report on the Statistics of Tasmania. Paper relating to Her Majesty's Colonial Possessions. Part i. Pp. 218–242. 8vo.

The produce of coal and iron is stated, and analyses of ores given.

Skene, A. J., and R. B. Smyth. Report on the Physical Character and Resources of Gippsland. Pp. 65 (map and sections). 8vo. Melbourne.

The geological observations have enabled some alterations to be made in the maps of the colony, and seem to show that the divisions marked between the Lower Silurian, the metamorphic and crystalline schists, and the granites and porphyries are not justified. In describing the useful minerals of Gippsland, it is said that 461 reefs have been proved to be auriferous. The metalliferous minerals are chiefly iron-ores, argentiferous galena, and oxide of tin. The rare mineral *Osmiridium* is recorded from near Stockyard Creek. No Carboniferous rocks, differing in age from those at Cape Patterson and Cape Otway, have been discovered. Appended is a table, showing the areas of the several geological formations in Gippsland. F. W. R.

Skey, W. Notes upon the Mineral Oils of New Zealand. Trans. New-Zealand Inst. vi. pp. 252–259.

The oils are of three kinds and from three places.

1. From the Sugar Loaves, in Taranaki Province. Possesses a specific gravity of ·960 to ·964 at 60° F.; by reflected light is dirty green and opaque, but exhibits a deep red colour by transmitted light; is quite liquid, and does not solidify when reduced to 5°; the odour is mawkish, but not unpleasant; boils at 340°, and does not evaporate at the ordinary temperature. It is recommended as a lubricant. 2. Oil from Poverty Bay, east coast of Auckland Province. A true paraffin oil, opalescent; when warmed, translucent; red by transmitted and blackish green by reflected light; its vapour inflames at from 230° to 233°; sp. gr. varies from ·864 to ·871 at 60°; passes into a jelly-like mass at 50°. 3. Oil from Manutahi, on the Waiapu river, East Cape. One of the lightest native oils of New Zealand tested by Mr. Skey; pale brown, nearly transparent; flows with great freedom; has the odour of kerosene; sp. gr. ·8294 at 60°. Burns well in a kerosene-lamp. R. E., Jun.

Smyth, R. B. Geological Survey of Victoria; Report of Progress, Melbourne. Pp. viii, 135; 14 plates (maps and sections), and woodcuts.

Mr. Smyth reports (pp. 1–62) the publication or completion of various geological maps and sections, and the progress made in the compilation of his great geological map, in which, amongst other points, will be shown the three chief metalliferous belts. The coal-seams of Cape Patterson, Cape Otway, and Wannon-River districts have been re-examined; but none, under present circumstances, are workable. Suggestions for the utilization of the deposits of lignite and various ores of iron existing in the colony are given. A list of the principal fossils is furnished by Prof. M'Coy, to which is added a synopsis of the fossil fruits from the Tertiary auriferous drifts recently described by Baron von Mueller (see *post*).

A Report on the Geology and Mineral Resources of Ballarat, by R. A. F. Murray, follows (pp. 63–88).

The formations treated of are Granite, Lower Silurian, with auriferous quartz-reefs, Tertiary gold "drifts," and auriferous "leads." The most important portion is the description of the Tertiary drifts and leads and the quartz-reefs traversing the Silurian rocks. The Ballarat gold-drifts occur in four epochs:—the "oldest period," those drifts antecedent to the date at which the "lead-channels were eroded to their present depth;" the older period, embracing the deep lead-drifts between the various lava-flows; those of the "recent period," laid down immediately after the most recent lava-flow; and the most recent, or all drifts accumulated since the deposition of those of the recent period, &c.

The three great channels of exit of the Ballarat leads correspond to the present valleys of the Yarrowee, or Leigh river, on the south, the Burrumbeet on the west, and the Moorabool river on the east.

Then come Reports on the "Coal Fields:"—The first on the Loutit-

Bay District, by C. HODGKINSON, R. B. SMYTH, and T. COUCHMAN (pp. 91–98). The series of beds closely resemble those of the Cape-Patterson and Griffiths-Point areas, except that basalt-dykes and volcanic rocks associated with the carbonaceous series of the latter places are not present. A few very small coal-seams were seen. There is an Appendix on the Cape-Otway District, by F. M. KRAUSÉ, (pp. 99–110,) which deals with that part of the Secondary coal-bearing or carbonaceous rocks occupying an area of 600 square miles in the S.W. part of the Colony, portions of which are overlain by Tertiary beds. From a lithological point of view the coal-bearing beds were found not to differ materially from those of Western Port and Cape Patterson in S.E. Victoria. With the exception of a mass of older volcanic lava near Airey's Inlet, volcanic products are absent. Little additional evidence was obtained as to the disputed age of these carbonaceous beds. Fifteen seams of coal were examined, all less than a foot thick. The thickest seam crops out at the Wild-Dog Creek, Apollo Bay, and has been successfully used by the inhabitants. The immediately overlying, unconformable, and supposed Miocene beds are exposed from Jan Juc to near Point Castries, in cliff-sections upwards of 300 feet in thickness, and in outliers west of Cape Otway; they probably extend inland along the northern base of the coast dividing range as far as Gerangamete. Overlying these, but frequently resting on the Carbonaceous series, are fine-grained ferruginous sandstones, concretionary nodules of ironstone, quartz-conglomerates, and quartz-gravel, which are termed Pliocene, and occur at from 300 to 1200 feet above the sea-level. The recent accumulations along the coast consist of sand-dunes and calcareous aggregations, whilst at the mouths of some of the estuaries and creeks signs of terraqueous changes are visible.

Reports on the Apollo-Bay and Wannon Districts, by R. B. SMYTH and T. COUCHMAN, follow (pp. 113–124).

Apollo Bay is in a small synclinal fold. The beds are of a similar lithological character to those on the same line of coast at Loutit Bay, and also a similar absence of all volcanic phenomena is to be noticed. A few coal-seams, a few inches thick, were met with.

In the Wannon district a small seam of coal, 4 inches thick, was pointed out; otherwise the coal-bearing features of this district do not appear to be favourable.

There is an Appendix, by F. M. KRAUSÉ, on the Sandstones of the Grampian Range (pp. 125–130). This range encloses an area of 1220 square miles, of which about 780 are of the Grampian freestone. The extent from Mount Sturgeon, on the south, to Mount Zero, on the north, is about 54 miles, whilst the greatest breadth, from Mount William, on the east, to Mount Dundas, exceeds 40 miles. The freestone rests in some places on granite, in others unconformably on the Silurian and Metamorphic schists of the gold-fields; the beds dip at from 10° to 50°. The freestone is said to reach a thickness of 1500 feet, without material change in lithological character. Near the junction with the

granite at Rose's Gap, tabular micaceous iron and iron-glance are found, possessing magnetic properties, and with 70 per cent. of metallic iron.
R. Jun.

STEPHENS, T. The Mersey Coal-Measures, Tasmania. Monthly Notices, Roy. Soc. Tasm., for 1873, pp. 36–38.

Refers to an opinion of Mr. Hainsworth, that the Mersey Coal Measures may be identified with that part of the New-South-Wales Coal series known as the West Maitland Beds. The author records the occurrence of a species of *Glossopteris*, probably *G. Browniana*, near Tarleton, Tasmania, in the Mersey Coal Measures, and expresses his opinion that the Coal Measures of the Fingal district are of more recent date than those of the Mersey district. R. E., Jun.

THOMSON, J. T. On the Glacial Action and Terrace Formations of South New Zealand. Trans. N. Zealand Inst. vi. pp. 309–332.

During the Tertiary period the southern part of New Zealand was much lower than now and within the region of glacial action. Mr. Thomson has discovered the remains of glacier-moraines of two ages. The younger, at the lower ends of some of the interior lakes, are the result of the action of mountain-glaciers. The older are the result of terrene-glaciers, and far exceed the younger in extent and influence; their existence is indicated by the boulder-deposits and scattered striated boulders in many parts of Otago. In the Kaikorai valley are rock-surfaces on which grooves, up to a foot deep and parallel to the direction of the axis of the valley, were seen. The regularly curved beds of many of the valleys are shown to conform to the curve of the ellipse. The erosion of these valleys is ascribed to the action of gigantic glaciers descending from the mountains, projecting into the sea, and ending in perpendicular cliffs, like those of South Victoria Land, in the Pacific. During the Glacial period this part of New Zealand underwent the same phenomena as now occur at the Antarctic circle.

The terrace-formations of Otago are at all levels, from the mountain-tops to the shore. They consist of shingle and gravel, loosely bound by clay and sand. Two laws are observable in connexion with the formation of these terraces:—the law of deposition, the particles becoming smaller as the transporting power became weaker; and the law of deposition and formation, for the "terraces incline as you close in with the mountains, and they tend to be level as you leave them, and only become perfectly level on the sea or lake shores." The terraces are considered to be the result of marine and freshwater action, during elevation, on the shingle and gravel accumulated during the glacial age. Mr. Thomson has investigated certain fan-like alluvial deposits of the plains of the Middle Island, and finds that there are two laws demonstrated by them:—the law of scooping out, as the ellipse; that of spreading out, as the parabola. R. E., Jun.

TRAVERS, W. T. L. On the Extinct Glaciers of the Middle Island of New Zealand. Trans. New-Zealand Inst. vi. pp. 297–309.

The many glaciers of the first order still found in the valleys radiating from Mount Cook are the remains of an old glacier-system of great extent. All the larger valleys running into the main range show signs of a former occupancy by ice. The extent of the extinct glaciers north of Mount Cook had a distinct relation to the height of the mountains in which they originated. Under existing conditions of climate, an average height of 13,000 or 14,000 feet of those parts of the Middle-Island range which do not exceed 9000 feet would be required for their production, as they probably originated during a period of upheaval to the extent of at least 4000 or 5000 feet, when, in all probability, the present islands of New Zealand were connected, and dry land extended to the eastward, perhaps beyond Raoul Island, on the north, by the Chatham group to the Antipodes Islands on the south. The disappearance of these glaciers is attributed to a depression of the land during Pleistocene times, the elevation previously mentioned having taken place at the close of the Miocene, with its maximum during the Pliocene period. Not only are the glacial phenomena of the Middle Island displayed by huge lateral and terminal moraines, roches moutonnées, and blocs perchés, but also by a well-defined series of north and south lakes. Mr. Travers considers that there is no evidence of a Pleistocene glaciation in the Middle Island. R. E., Jun.

ULRICH, G. H. F. A Report on the Mount-Bischoff Tin Mines, Tasmania, with Topographical Sketch Map. Pp. 5. 8vo. Launceston.

The ore-bearing rock is a "eurite," or quartz-porphyry, composed of a white felspathic and mainly quartzose, minutely granular base, densely filled with imperfect crystals and grains of quartz. The principal mass of this porphyry forms the top of Mount Bischoff, which reaches to a height of about 3000 feet. The tin-ore occurs as an original deposit, in veins and bunches, or impregnated in the porphyry; and as stream-tin dispersed through surface-drift. The latter is the most prolific source. The drift is chiefly made up of quartz-sand with ferruginous clay and subangular fragments of porphyry, slate, and sandstone, the tin-ore particles dispersed through it varying in size from that of a bean to pieces many pounds in weight. R. E., Jun.

VOELCKER, Dr. A. Analyses of Queensland Soils. Pp. 1–19. 8vo. Lond. [Issued as a pamphlet with other Emigration information by the Agent-General for the Colony.]

The soils reported on are:—*Alluvial Scrub Soils*, distinguished by containing, in addition to a considerable quantity of organic matter, the more important mineral elements which enter into the composition of fertile soils. *Forest Soils* resemble the former, but are more deficient in nitrogen, potash, lime, and phosphoric acid. *Red-coloured Soils*, derived from the decomposition of Trap Rocks, all rich in peroxide of iron, but poor in nitrogen, potash, lime, and phosphoric acid. *Black Soil of Darling Downs*, a stiff, dark-brown, almost black soil, with a good deal of alumina and some potash, but poor in lime and phosphoric acid. Mechanical and chemical analyses are given. R. E., Jun.

WILKINSON, C. S. Tin-bearing Country, New England, in New South Wales, Australia. Report to the Surveyor-General, dated 14th July, 1873, and, under the title "Tin Deposits of N. S. Wales," in Iron, vol. iii. pp. 267, 296, 325.

Reports of the Mining Surveyors and Registrars [Victoria] for the Quarters ending Dec. 31st, 1873, March 31st, June 30th, and Sept. 30th, 1874. Melbourne.

Gives the yield of minerals of economic value, with occasional special reports on geological and palæontological subjects. R. E., Jun.

PHYSICAL GEOLOGY.

1. *VOLCANIC PHENOMENA; METAMORPHISM; UNDERGROUND TEMPERATURE; CHANGES OF LEVEL; MOUNTAIN-BUILDING.*

Alexander, T. M. The newly discovered Crater of Maine. Amer. Journ. ser. 3, vol. vii. pp. 525, 526.

From a letter to the 'Hawaiian Gazette.'

Anon. Oscillazione delle coste di Dalmazia. [Oscillations of the Coast of Dalmatia.] Boll. R. Com. geol. Ital. pp. 57–60.

Roman roads and villas in several places along the coast are now seen below the sea, showing that the land has sunk. Peninsulas have become quite detached from the land; and tracts that were once thickly inhabited, have by the change of level become so marshy and malarious as to be greatly depopulated. E. B. T.

Bertrand, G. Etudes sur les Volcans. Notes recueillées au cours de M. Ch. Sainte-Claire Deville. Bull. Soc. Indust. min. St. Etienne, 2 sér. t. iii. p. 65.

Bittner, A. Beobachtungen am Vesuv. [Observations on Vesuvius.] Verh. k.-k. geol. Reichs. pp. 287, 288.

A letter.

Black, J. M. An Account of the Eruption of Mount Vesuvius of April 1872. Proc. Geol. Assoc. vol. iii. no. 6, pp. 253–265.

Narrates the progress and effects of the eruption.

Boué, Dr. A. Ueber den Begriff und die Bestandtheile einer Gebirgskette, besonders über die sogenannten Urketten, sowie die Gebirgs-Systeme-Vergleichung der Erd- und Mondes-Oberfläche. [On the notion and composition of a Mountain-range, particularly the so-called Primitive ranges; also on the comparison between the Systems of Mountains on the Earth and Moon.] Sitzb. k. Ak. Wiss. math.-naturw. Classe, Abth. i. Bd. lxix. Heft 3, pp. 237–300.

In discussing the formation of mountains, Laplace's theory of the origin of the solar system is made the basis of all reasoning on the past and present state of the earth: a cooling surface and heated interior is assumed. After glancing at various abandoned notions concerning the crystalline schists, the author notices their occurrence in most of the chief mountain-ranges; they are shown to be intimately connected with Palæozoic beds; indeed fossils have been found in mica-schist, proving it in one case to be a metamorphosed Carboniferous deposit. The change in form of continents is discussed: it is laid down that elevations of mountains imply sinkings of ocean-floors, and so changes of land-area, numerous proofs of islands that are relicts of continental land &c. being adduced. The author agrees, for the most part, with E. de Beaumont's systems of mountains. The influence of plutonic action in the composition of mountains is touched upon, and the moon's phenomena are compared with our earth's surface. Numerous remains of undoubted craters are given; but, further, various circular areas, enclosed by hills, are supposed to be probably remains of giant craters that have been covered up and obscured by later sedimentary formations, the present courses of rivers being in those cases held to support this view. Appendices give copious references to the cases adduced throughout the essay. E. B. T.

Bradley, F. H. Note on the Recent Earthquakes of Bald Mountain, in Rutherford County, North Carolina. Amer. Journ. ser. 3, vol. viii. p. 79.

A note of a trip to Bald Mountain after the Earthquake. There is no foundation for the stories of yawning crevices and smoking pits. The real phenomena presented were the usual ones of earthquakes; and there was nothing volcanic about them. G. A. L.

Brauns, D. Die Resultate der Temperaturmessungen in grösseren Tiefen, besonders im Speremberger Bohrloche, und ihre Bedeutung in theoretisch-geologischen Hinsicht. (The results of determinations of Temperature at great Depths, specially in the Speremberg Bore-hole, and their bearing on points of Theoretical Geology.) Zeitsch. gesam. Naturwiss. pp. 483–496.

Capanema, G. S. Die Sambaquis oder Muschelhügel Brasiliens. [The *Sambaquis*, or Shell-heaps of Brazil.] Petermann's Mittheilungen, Bd. xx. pp. 228–230.

Description of shell-middens of the Brazilian coast, and a discussion of the rising of that coast, which is now going on, and which the author has proved, from Ceará to Santa Catharina. The connexion between this phenomenon and the shell-heaps, and also with the lagoons along the coast, is explained. G. A. L.

Coan, T. Note on the Recent Volcanic Action in Hawaii. Amer. Journ. ser. 3, vol. vii. pp. 516–517.

A description of the eruptions from Aug. 1872 to Jan. 1874.

Colvin, A. Origin of Earthquakes. Geol. Mag. dec. 2, vol. i. p. 95.

Controverts Mr. Mallet's view that earthquakes are due to the action of underground water wearing away rocks.

Dana, Prof. J. D. Notes on the New Edition of Mr. Darwin's work on the Structure and Distribution of Coral Reefs (1874). Amer. Journ. ser. 3, vol. viii. pp. 312–319.

Urges that while barrier-reefs are proofs of subsidence, "small or fringing reefs are in themselves no certain evidence of a stationary level, and are often evidence of subsidence." Reasons are given for differing from Mr. Darwin as to the limits of the areas of subsidence and elevation in the Pacific. G. A. L.

Dana, Prof. J. D. Coral Reefs of Hawaii. Amer. Journ. ser. 3, vol. viii. p. 466.

Ellis states that round several parts of Hawaii there are raised coral-reefs, twenty feet above the sea-level; this is an extract from a letter, denying the statement. A. H. G.

Dieffenbach, F. Die Erdbeben und Vulkanausbrüche des Jahres 1872. N. Jahrb. Heft ii. pp. 155–163.

A record of earthquake and volcanic activity during the year 1872.

Everett, Prof. J. D. Sixth Report of the Committee on Underground Temperatures. Rep. Brit. Assoc. for 1873, pp. 252–256.

In the boring of the well of La Chapelle, Paris, the increase of temperature down to a depth of 600 metres was pretty regular, at an average rate of 1° F. for every 94 feet: 60 metres lower an increase about four times as rapid was found, which was conjectured to be due to the heat produced during the boring-operations. This conjecture was found to be correct. After the water had stood undisturbed for sixteen months, a fresh set of observations was taken: the temperatures down to 600 metres were sensibly unchanged; the temperature, at a depth of 660 metres had fallen from 83°·25 to 76°. The average rate of increase was 1° F. for 94·3 feet, if the temperature at a depth of 100 metres be taken for the invariable temperature; 1° F. for 84 feet, if the temperature of the caves under the Paris Observatory be so taken. At the Kentish-Town well the thermometer, placed at a depth of 1000 feet, has been raised and read three times; it shows each time a decrease in temperature; Mr. Symons is discussing this result. Mr. Lebour reports that the abnormal increase of temperature observed in the South-Hetton bore-hole arose from insufficient time having been allowed to the thermometer. A. H. G.

——. On Underground Temperatures. Proc. Belfast Nat.-Hist. and Phil. Soc. 1873–74, pp. 41–50.

A *résumé* of the observations and reasonings of the author and others. Full references.

Fisher, Rev. O. On the Formation of Mountains, viewed in connexion with the Secular Cooling of the Earth. Geol. Mag. dec. 2, vol. i. p. 60.

Outline of a paper read to the Cambridge Philosophical Society.

——. On the Formation of Mountains; being a reply to Capt. Hutton's article, p. 22 of same volume. Geol. Mag. dec. 2, vol. i. p. 64.

Geikie, Prof. A. On some Points in the connexion between Metamorphism and Volcanic Action. Trans. Edin. Geol. Soc. vol. ii. part 3, pp. 287–307.

Shows we might expect that metamorphism and volcanic action will be found to go together, thus:—Metamorphism always goes along with intense crumpling; and where there has been intense crumpling a shattered region is produced, up which internal heat will find its way, and down into which water will penetrate; and these are conditions tending to produce volcanic action.

Gives instances which seem to show that there is a connexion between the two, and that periods of great metamorphism have been also periods of great volcanic activity, dwelling specially on that furnished by the metamorphosed L. Silurian of Scotland. Anticipates the objection that volcanic action is superficial, while metamorphism is believed to have been produced at great depths, by showing that these depths have been overrated, bringing forward evidence that the rocks of the Highlands could not have had a thickness of more than 5000 feet over them when they were metamorphosed. Having shown that metamorphism is not a question of depth, the author argues that it is related to crumpling, pointing out by way of instance that the lowest parts of the L. Silurian of the north of Scotland, which have been buried under the greatest thickness of rock, *but are not crumpled*, are but little altered, while higher parts of the series, which were not so deeply buried, *but are intensely crumpled*, are highly metamorphosed; and adds that there are many rocks which have had 10,000 to 12,000 feet of beds above them, and are yet unaltered. Distinguishes between broad folding into troughs and arches and complicated puckering: it is the latter that so persistently accompanies metamorphism, while the former has often taken place without any metamorphism being produced. It is probable that extreme metamorphism may end in the production of granitic rocks, and that when a melted magma has been produced underground by intense metamorphic action, it will take the form of lava if it is forced out above ground, and of intrusive granite if it harden underground; and in support of this view some new instances of the passage of granite through elvanite into felstone are given. This leads to the belief that many of the granite bosses in the Southern Uplands of Scotland are volcanic necks, and the general conclusion that many of the so-called hypogene rocks have not had the deep-seated origin usually ascribed to them, but have been thrust up near to, if not quite to, the surface. Many of the characteristic "Vesuvian minerals" are not found in lava, but in blocks of altered rock, among the old tuffs of the mountain; and some of the same minerals occur among the metamorphic rocks of Scotland—a fact which may be explained by supposing that the metamorphism of the rocks surrounding Vesuvius is still in progress, and is one of the changes comprised within the circle of what is called volcanic action. A. H. G.

Hilgard, Eug. W. On some Points in Mallet's Theory of Vulcanicity. Amer. Journ. ser. 3, vol. vii. pp. 535–546; and Phil. Mag. ser. 4, vol. xlviii. pp. 41–53.

Review of Mr. Mallet's paper, in Phil. Trans. vol. clxiii. p. 147 (1873). On the whole, favourable to his views. Discusses the Pacific coast fissure-eruptions and Prof. Le Conte's theories thereon. G. A. L.

Hirschwald, J. Ueber die Umwandlung verstürzter Gruben-Zimmerung in Braunkohle aus dem "alten Mann" der Grube Dorothee auf dem Oberharz. [Conversion of timber into Brown Coal, as seen in the ancient workings of the Dorothy Mine in the Upper Hartz.] Verh. k.-k. geol. Reichs. pp. 14, 15.

Describes a visit to the mine, the drifts of which had cut through certain old workings, filled up with masses of clay-slate, along with the original timbering. The timbers had been partially converted into a regular brown coal, apparently as the result of their permeation by water with mineral matter in solution, whilst at the same time subjected to a high temperature, comparatively speaking, and a very considerable amount of pressure from the superincumbent rock. H. A. N.

Howorth, Henry H. Recent Elevations of the Earth's Surface in the Northern Circumpolar Regions. Journ. Roy. Geogr. Soc. vol. xliii. pp. 240–263.

The author's conclusions are:—"that the great mass of land that surrounds the North Pole . . . . is undergoing a general movement of upheaval . . . . and in those areas which are accessible enough to enable us to experiment, as in Scandinavia &c., we find that the movement is going on now at a greater or less rate. This general movement of Circumpolar land having its focus apparently near the Pole, has no doubt been coincident with a corresponding revolution in other physical phenomena, such as climate, the distribution of magnetism," &c. . . . . G. A. I.

Hunt, Dr. T. S. The metamorphism of Rocks. Proc. Amer. Assoc. vol. xxii. B. pp. 115, 116 (abstract).

Hutton, Capt. C. E. A criticism upon the Contractional Hypothesis. Amer. Journ. ser. 3, vol. viii. pp. 113–123.

Concludes that the greatest possible contraction due to secular cooling is insufficient to account for the phenomena attributed to it by the contractional hypothesis. Suggests that if we were to assign 30 miles as the diminution of the earth's mean radius since the formation of a cooled exterior, we should probably reach the utmost limit consistent with Fourier's theorem. By far the larger portion of this contraction must have taken place before the commencement of the Palæozoic age; by far the larger portion of the residue must have occurred before the beginning of the Tertiary; and yet the whole of this contraction would not be sufficient to account for the disturbances which have occurred since the close of the Cretaceous. E. B. T.

Hutton, Capt. F. W. On the formation of Mountains. Geol. Mag. dec. 2, vol. i. p. 22.

A reply to the Rev. O. Fisher's criticisms on the author's paper in vol. x. p. 166.

Jespersen, M. Creeps. Geol. Mag. dec. 2, vol. i. p. 238.

Inquires whether earthquakes, igneous ejections, and elevation of mountains may not be caused by subsidences, analogous to "creeps," caused by the removal of underground masses of rock by percolating water. A. H. G.

Mallet, Robert. In reply to Mr. Scrope's observations on Mr. Mallet's Theory of Volcanic Energy (p. 28 of same vol.). Geol. Mag. dec. 2, vol. i. pp. 127 & 189.

Explains that he does not commit himself to any opinion about the state of the earth's interior further than that it is hotter than the exterior, and that the heat lost by radiation gives rise to mechanical work, part of which is transformed into heat, which is the cause of volcanic action. He believes that with a thin crust and a liquid nucleus no open fissures could penetrate through the crust, and that if they did the melted matter would not rise through them. He points out that there are variations in the rate of increase of underground temperature which cannot be accounted for by conductivity alone, but which his theory explains. He maintains the approximate accuracy of the data on which he has based his numerical calculations, and concludes by pointing out that Mr. Scrope admits some degree of squeezing and crushing of rocks by internal movements, which, he says, amounts to an admission of his theory. The controversy is continued on pp. 332 and 478. A. H. G.

——. Additions to the paper on Volcanic Energy &c. (Phil. Trans. 1873, p. 147). Proc. Roy. Soc. vol. xxiii. p. 328.

Calculations have been made, on certain allowable suppositions, as to the amount the solid shell of the earth *must* be crushed to admit of the shell following down on the more rapidly contracting nucleus. The annual amount of contraction of the globe is estimated at little more than 3·5 inches on the mean radius for the last 5000 years, supposing the contraction to have been uniform during that time. This quantity is too small to be capable of having produced, during the last 2000 years, any sensible effect on the length of the day. A. H. G.

——. On the Mechanism of Stromboli. Proc. Roy. Soc. vol. xxiii. p. 496.

Comments on the rhythmical character of the outbursts, which has not received satisfactory explanation, but may be accounted for by supposing that we have in Stromboli the same succession of phenomena as those of a geyser, superadded to some of those of a volcanic vent of feeble but long-continued activity. The explanation could not be made intelligible without a figure. A. H. G.

Morris, Prof. J. Landslips and sinkings in Cheshire. Geol. Mag. dec. 2, vol. i. pp. 259-261. [Notice of a Report, by J. Dickinson, presented to the House of Commons 1873.]

The salt of Cheshire is partly mined as "rock-salt," and partly pumped up in the form of brine. Salt has been produced from brine for more than 1000 years; for long ages before that there must have been constant waste of the salt going on, especially near the outcrop. This continuous abstraction of salt from below has resulted in serious slips and subsidences of the surface. The earliest recorded sinking took place in 1533; since then there have been many others, and the movements are still going on. Northwich is only 20 feet above the sea-level, and the thickness of the salt-deposits is there 180 feet; Winsford is 40 feet above the sea, and the thickness of the salt is 210 feet. Mr. Dickinson remarks:—"It is evident from the surface-level being at a considerably less elevation above sea-level than the thickness of rock-salt underneath, the subsidence now so actively begun at Northwich and Winsford may end in the whole of this portion of Cheshire being submerged." W. T.

NILES, Prof. W. H. On some expansions, movements, and fractures of Rocks observed at Monson, Mass. Proc. Amer. Assoc. vol. xxii. B. pp. 156–163. [See also WING, p. 171.]

Gives an account of phenomena to be observed in some Gneiss-quarries. When a stone of considerable length is quarried from any undisturbed portion of a bed, expansion is found to occur lengthwise in the block, which is slightly longer than the place from which it was broken. This happens only in a N. and S. direction. The expansion takes place immediately. Anticlinals are often formed in these quarries, the axes of which are always E. and W. The most common phenomena are fractures of the rock, accompanied by explosions and considerable displacement. Lateral pressure is the assigned cause of these manifestations. G. A. L.

NÖGGERATH, T. Die Ursachen der Erdbeben. [The cause of earthquakes.] Das Ausland, pp. 821–824, 851–854, 865–867, 885–888.

PERREY, ALEXIS. Etude du Réseau Pentagonal dans l'océan Pacifique. [The Pentagonal system in the Pacific.] Compt. Rend. t. lxxix. pp. 444.

Has drawn M. Elie de Beaumont's lines upon the five-sheet chart of the Pacific issued by the French Dépôt de la Marine, and finds that they coincide to a great extent with orographical and volcanic features. G. A. L.

POËY, A. Rapport entre les taches solaires, les tremblements de terre aux Antilles et au Mexique et les éruptions volcaniques sur tout le globe. [On the relations between sun-spots, earthquakes, and volcanic eruptions.] Compt. Rend. t. lxxviii. pp. 51–55.

Arrives at the following conclusions:—that atmospheric phenomena and those of the crust of the earth are found generally cumulating towards decennial periods, grouped alike around the maxima and the minima of the spots; that all the phenomena derived directly or indirectly from *heat* correspond more nearly to the minima, while those emanating from *cold* follow the maxima of the spots; that this influence of the solar spots is a question of temperature, whence proceeds, by means of equivalent evolutions and transformations, the whole of our terrestrial phenomena; and that the earthquakes of the W. Indies and Central America seem to be nearly as frequent and as intense at both the maxima and the minima of the spots. G. A. L.

Reiss, W. [South American Volcanoes.] Zeitsch. deutsch. geol. Gesell. Bd. xxvi. Heft 3, pp. 605–609.

Describes visits to the volcanoes of Sangay, Tunguragua, Pelileo, &c.

Roberts, T. Volcanoes and Volcanic Agency. Proc. Liverpool Geol. Soc. sess. 15, pp. 3–15.

In 1873 the author found the grottoes near Lake Avernus giving off ammonia, carbonic acid, and sulphurous vapour of a temperature of 180° F., which deposited a yellow crust of basic persulphate of iron. The flow of the gases is effected by the eruption of Vesuvius. C.E.De R.

Rossi, Prof. M. St. de. Bullettino del Vulcanismo Italiano. Periodico geologico ed archeologico per l' osservazione e la storia dei Phenomeni endogeni nel suolo d' Italia. Vol. i. Rome.

Schmidt, Jul. Vulkanstudien. Santorin, 1866 bis 1872. Vesuv, Bajae, Stromboli, Aetna, 1870. 7 plates. 8vo. Leipzig.

Scrope, G. P. Observations on Mr. R. Mallet's paper on Volcanic Energy (Phil. Trans. 1873, p. 147). Geol. Mag. dec. 2, vol. i. p. 28.

Contends that the theory which accounts for volcanic energy by the check given to the escape of internal heat by the accumulation of thick deposits of low conducting power, is perfectly satisfactory, and that therefore Mr. Mallet's explanation is not wanted. Shows that some of Mr. Mallet's views as to the nature of volcanic action, and his statement that there are no traces of explosive volcanic action in the Palæozoic rocks, are incorrect, and denies that we have data enough to enable us to calculate what will be the amount of heat produced by the crushing of rock during the earth's contraction. The controversy is continued on pp. 237 and 342. A. H. G.

——. A review of Messrs. Nasmyth's and Carpenter's book on the Moon. Geol. Mag. dec. 2, vol. i. p. 272.

Comments on the difference between the volcanic manifestations of the moon and the earth. The large craters of the moon are not, like many of the great crater-rings of the earth, the "basal remnants" of volcanic cones, but rather resemble terrestrial crater-lakes, and seem to have been produced by the sudden bursting of enormous bubbles of highly elastic vapour. The craters were afterwards filled by lava that welled up slowly, and in some cases burst through the walls and spread out around in great sheets. The lava-flows on cooling became fissured, and through the rents more lava was forced up, sometimes along their whole length, sometimes only here and there. In the absence of air and water there has been no subaërial denudation, and no coating of sedimentary rocks to check the escape of internal heat; and hence the cooling of the moon has gone on very rapidly. A. H. G.

Scrope, G. P. The Mechanism of Stromboli. Geol. Mag. dec. 2, vol. i. pp. 529–542, 3 woodcuts. A criticism on Mr. R. Mallet's paper on this subject (see p. 166).

Shows that Mr. Mallet's measurements of the height of various points of the mountain above the sea-level, which were made with an aneroid, are different from those of the best authorities. Maintains that a fortuitous concurrence of water, steam, and lava, such as Mr. Mallet's explanation requires, is a complicated and wholly imaginary supposition, without example and unsupported by any facts or reasoning of the slightest value, the grounds on which this judgment is based being fully given. A. H. G.

Silvestri, Prof. **Orazio**. Fenomeni erruttivi dell' Etna nell' interno del cratere centrale. [Eruptive phenomena in the interior of the crater of Etna, July, 1874.] Boll. R. Com. geol. Ital. pp. 244–247.

Finding the volcano increasing in premonitory symptoms, the author predicted an eruption (which ensued the month after). On looking into the crater, flashes of light were seen every two or three minutes, soon succeeded by reports as of artillery. Calculating from the rate of transmission of sound, the ignited matter must have been at a depth of 600 metres. The mountain has had five years of unusual repose. See also his letter on the same subject in Zeitsch. deutsch. geol. Gesel. Bd. xxvi. Heft 4, pp. 928–930. E. B. T.

——. Notizie sulla eruzione dell' Etna del 29 Agosto 1874. [Notice of the eruption of Etna, August 29, 1874.] Boll. R. Com. geol. Ital. pp. 312–322. Reprinted from the Catania Gazette. See also 'Nature,' vol. x. p. 522.

The eruption began with two shocks and the emission of a huge mass of black smoke; it lasted only seven hours, and then began to diminish. At the height of 2450 metres an enormous crack was produced, running N. 8° E., with a width of 60 metres at the widest, and with a total length of 3 kilometres. Along this chasm are numerous little craters, 1 to 3 metres, from which a few ashes and scoriæ were vomited. The reason of the eruption ceasing before it had scarcely developed itself the author considers to be the diversion of the lava into some subterranean channels possibly existing below. E. B. T.

Skey, W. On the Evolution of Heat during the Hydration of Clay-slate, Clay, and Coal. Chem. News, vol. xxx. no. 787, pp. 290, 291.

On mixing ground clay-slate with water heat was evolved, this heat being attributed by the author to the chemical hydration of the rock. Some other rocks and minerals behaved in a similar way. The author concludes that heat is generally evolved during the disintegration of rocks, and that the differences in temperature sometimes observed between contiguous strata may be wholly or partially due to this source. F. W. R.

Stöhr, E. Die Provinz Banjuwangi in Ost-Java mit der Vulcangruppe Idjen-Raun. [The province of Banjuwangi, in E. Java, with the volcanic group of Idjen-Raun.] 120 pp., 1 map, 7 plates. 4to. Frankfurt.

Reprint from Abhand. Senckenb. naturforsch. Gesell. Bd. ix. Some geological information, chiefly on volcanic phenomena, is given.

Tardy, —. Comparaison entre deux oscillations contemporaines en Flandre et en Emilie. [Comparison of two contemporaneous oscillations in Flanders and in Emilia.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 222, 223.

Shows on archæological evidence that whereas in Flanders the land rose from the 7th to the 10th century, the Adriatic coast was sinking from 530 A.D. to the beginning of the 11th century. At present the reverse action is taking place: the north-western Adriatic is rising, and the Flemish coast is sinking. G. A. L.

Taylor, Andrew. Notice of a recent instance of Coal being converted into Graphite during an explosion in a Lanarkshire Coal-pit. Trans. Edin. Geol. Soc. vol. ii. part 3, p. 368.

Concludes that the specimen exhibited did not support the view that a high temperature is necessary for the conversion of coal into graphite. H. A. N.

Vaughan, D. Physics of the Internal Earth. Phil. Mag. ser. 4, vol. xlviii. pp. 237, 238 (Brit. Assoc.).

The author speaks of the terrestrial crust as reposing on lava of a declining temperature, and accounts for earthquakes by supposing solid material to be formed at the internal surface of the crust, and sometimes to move upwards, as, so to speak, an avalanche. These avalanches convey heat upwards, and tend by fusion and erosion to lessen the thickness of the crust in certain spots, which thus become the localities for volcanoes. Chemical reasons are adduced to show why the formation of buoyant solids must occur. F. D.

Vogt, C. Üeber Volcane. [About Volcanoes.] 8vo. Basle. A lecture.

Ward, Dr. O. On Rock Fissures and Faults. Papers Eastbourne Nat.-Hist. Soc. 1873–74, p. 6.

The author refers these to volcanic action.

Whittlesey, Chas. On the Origin of Mountain Chains. Proc. Amer. Assoc. vol. xxii. B. pp. 51–54.

The theory adopted is that of "gradual compression, due to the contraction of the solid surface of the globe by radiation of its heat." G. A. L.

Wing, A. T. On spontaneous fractures and movements of rock in a quarry at Monson, Massachusetts. Proc. Boston Nat.-Hist. Soc. xvi. pt. 1, pp. 41, 42. See also Niles, p. 167.

On quarrying away portions of the rock other parts became upheaved, sometimes with violence and noise. One of these breaks moved 10,000 tons southward for three quarters of an inch. The deeper we go in the rock the greater the amount of expansive movement. E. B. T.

See also the following :—

Gaspard, A. Oscillations of Dunkirk Coast : p. 65.

Gorceix. Volcanic Phenomena, Nisyros : p. 66.

Grad, C. Emersion and Upheaval, N. Polar Regions : p. 108.

Howorth, H. H. Changes in S. Circumpolar Region : p. 152.

Johnstrup, F. Dislocation and Upheaval, Möens Klint : p. 74.

Lory, C. Fan-shaped structure of the Alps : p. 80.

Nathorst, A. G. Changes of level, Scania : p. 85.

Voisin, H. Boring at Sperenberg (temperatures) : p. 105.

2. *DENUDATION; GLACIAL PHENOMENA.*

Agassiz, Louis [the late]. Formation de la vallée de l'Amazone. La théorie glaciaire, &c. Rev. Sci. pp. 868–872, 892–897.

A report of part of a course of lectures at New York on the formation of the Amazon valley, the Glacial theory, &c.

Bachmann, Prof. J. Neuentdeckte Riesentöpfe in der Gegend von Bern. [Newly discovered Giant Kettles in the neighbourhood of Bern.] Berner Mittheilungen, p. 136.

Bell, Dugald. Notes on the Glaciation of the West of Scotland, with reference to some recently observed instances of Cross-striation. Trans. Geol. Soc. Glasgow, vol. iv. part 3, pp. 300–310.

After pointing out that the general glaciation of the Forth and Clyde valley is from W. to E. (or N.W. to S.E.), the author calls attention to a section at Possil, which shows two sets of striæ—one from the usual quarter, and the other from nearly due E. The latter is considered to be the newer, and is ascribed to land-ice, which, as it shrank in bulk, instead of remaining one continuous sheet, would in places form separate streams. Thus the changed direction of striæ is explained by the formation of two main inflows of ice towards the central part of the valley—one past the S.W. or Kilpatrick end of the range, and the other past the N.E. or Strathblane end. If the one shrank in bulk more than the other, a change in the direction of the striæ they were producing would ensue. G. A. L.

Belt, Thomas. An Examination of the Theories that have been propounded to account for the climate of the Glacial Period. Quart. Journ. Sci. no. xliv. p. 421.

Sir C. Lyell's and Mr. Croll's theories are rejected, and a change in the obliquity of the ecliptic is propounded as the producing cause. Increase of obliquity will cause a simultaneous accumulation of ice and snow round each pole: the water thus withdrawn from the sea will lower its level; the melting of the ice will raise the sea-level. The author attributes many oscillations of the sea-level to this cause rather than to upheaval and depression of the land. The polar accumulations of ice alter the figure of the earth, and tend to set up a series of strains in the crust; on the melting of the ice converse changes are brought about; and the author suggests that volcanic phenomena may be due to the action of these forces. By decrease of obliquity a warmer temperature would be produced; and this is perhaps the origin of the warm climate of early Tertiary times and of the Arctic regions during Miocene times. A. H. G.

Boué, A. Mittheilungen aus einem Schreiben der Herrn E. Collomb in Paris. [Communications from a letter of M. E. Collomb.] Verh. k.-k. geol. Reichs. pp. 118, 119.

The views of M. Collomb on the respective parts played by denudation and faulting in the production of the physical configuration of a country are given. H. A. N.

Bröggee, W. C., and H. H. **Reusch**. Giants' Kettles at Christiania. Quart. Journ. Geol. Soc. vol. xxx. p. 750. See also **Sexe**, p. 95.

Describes the Giants' Kettles as deep well-shaped pits in gneissose rocks, circular or sometimes elliptical in section, and with spiral groovings on the sides. They are filled in with moraine matter at the top; and below this there is a collection of regularly rounded stones and sharp irregular gravel. The kettles, it is suggested, may have been formed beneath an ice-sheet by surface-streams of water, which plunged down *moulins* and ground out a vertical shaft in the rock beneath the ice by the aid of the large rounded stones now found at the bottom of the kettles. A. H. G.

Brown, D. J. On some of the Glacial Phenomena of the neighbourhood of Edinburgh, as observed in the Pentlands, Blackford Hill, Bruntsfield Links, and Tyncastle Sandpit. Trans. Edin. Geol. Soc. vol. ii. part 3, pp. 351–357.

Notes facts indicating the occurrence of local glaciers in the Pentland Hills, and describes the glacial phenomena observed at the other localities mentioned. H. A. N.

——. On a New Theory for the Formation of Till or Boulder Clay. Trans. Edin. Geol. Soc. vol. ii. part 3, pp. 383–389.

Discusses the views generally entertained as to the mode of formation of Till or Boulder Clay, and propounds the theory that it owes its origin to glaciers, but only where these protrude into the sea. H. A. N.

Campbell, J. F. About Polar Glaciation. Quart. Journ. Geol. Soc. vol. xxx. pp. 450–478.

Refers to his extensive observations of glacial markings, and to a paper (Quart. Journ. Geol. Soc. xxix. p. 198) in which he gives a modified adhesion to the theory of a polar ice-cap, and states that the object of the present paper is to point out how far subsequent observations bear out the views there maintained. He cannot see his way to a general ice-cap reaching nearly to the equator, but believes there was an extension of the polar glaciation down to lat. 56° in the east of Europe, 55° in Germany, 50° in Britain, and 39° in N. America. A. H. G.

Carpenter, Dr. W. B. On the Physical Cause of Ocean Currents. Phil. Mag. ser. 4, vol. xlvii. p. 359.

A reply to Mr. Croll's papers, pp. 94, 168, of the same volume.

Chambrun de Rosemont, A. **de**. Sur la décomposition des dolomies de la côte de Nice sous l'influence des vagues. [Weatherings by the waves of the dolomites of the coast of Nice.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 219-221.

A description of the action of the waves near Cape Ferrat and at the Baousse-Rosse rocks near Mentone, on certain Jurassic dolomites. The surface of these rocks appears to be covered by a kind of varnish of a blackish colour usually, and having a vitreous lustre. No explanation is attempted. G. A. L.

Costa de Bastelica, Michel. Les torrents, leurs lois, leurs causes, leurs effets, moyens de les réprimer et de les utiliser. Leur action géologique universelle. [Torrents, their laws, causes, and effects, the means of checking and utilizing them. Their universal geological action.] 8vo, Paris.

Croft, Rev. C. Some modern aspects of Geological Science. [Abstract.] Trans. Plymouth Inst. vol. v. part i. pp. 33, 34.

Considers that the sea alone is capable of giving to the earth's surface its main outlines.

Croll, J. On the Physical Cause of Ocean Currents. Phil. Mag. ser. 4, vol. xlvii. pp. 94, 168, 434.

These papers have a geological bearing, because, according to Mr. Croll's views, the climatic conditions of the globe are dependent to an enormous extent on the distribution of heat by ocean-currents. The author believes that, when the eccentricity of the earth's orbit was at its maximum and the northern winter occurred in aphelion, the difference of temperature between the arctic and equatorial regions would be greater than that between the antarctic and equatorial regions; hence the N.E. trades would be stronger than the S.E. trades, and much of the warm equatorial water that is now driven, by the action of these and other winds, into the northern hemisphere, would be diverted to the southern hemisphere. Thus one source of heat would be transferred from the north polar to the south polar regions, and the cold already existing in the first would be intensified, while the genial climate of the second would be rendered still more genial. A. H. G.

——. On the South of England Ice-sheet. Geol. Mag. dec. 2, vol. i. p. 257.

Believes that during the last Glacial period the Scandinavian ice-sheet passed from the Baltic over Denmark, into the German Ocean, and that, if this were so, part of it must have passed across the south of England, and entered the Atlantic in the direction of the Bristol Channel. A. H. G.

——. On the Physical Cause of the Submergence and Emergence of the Land during the Glacial Epoch. Geol. Mag. dec. 2, vol. i. pp. 306, 346.

Shows that, in order that a sheet of continental ice may slide, it must be thickest in the centre, and estimates that the Antarctic ice-cap may be 12 miles thick in the middle, giving facts which show his estimate is not excessive. He then shows how the transference of the ice-cap to the other pole would result in a rise of the sea-level, and points out that the rise would be greater if the interior of the earth be fluid than if it be solid to the centre. He applies his views to explain the intermixture of the remains of northern and southern mammals in old river-gravels. A. H. G.

Dana, J. D. Glacial phenomena in Nicaragua. Amer. Journ. ser. 3, vol. vii. pp. 594, 595.

An *exposé* and critique of Mr. Belt's views (see p. 172).

Frazer, P., Jun. On the Exfoliation of Rocks near Gettysburg, Proc. Amer. Phil. Soc., vol. xiv., No. 93, pp. 295–297.

Notices peculiar weathering of Syenite-boulders in that part of the battle-field called the Devil's Den.

Frost, J. [nom de plume]. Behaviour of Glaciers and Ice-sheets. Geol. Mag. dec. 2, vol. i. p. 576.

Asks a question as to the reversed movement of ice in the higher part of an ice-sheet.

Geikie, Prof. Archibald. Introductory Address. Trans. Edin. Geol. Soc. vol. ii. part 3, pp. 247–267 (published separately under the title 'Earth Sculpture and the Huttonian School of Geology').

A general review of the doctrines held by the modern Huttonian School of Geologists as to the origin of mountains and the subject of denudation, but more especially a critical review of the views of the Duke of Argyll upon these questions (in his Presidential Address to the Geol. Soc. London). Enters in detail into the opinions of the Duke as to the origin and formation of several of the valleys and mountains of the Highlands, and maintains the correctness of the opposite views. Criticises the views expressed in the Duke's paper "On Six Lake-basins in Argyllshire" (Quart. Journ. Geol. Soc. 1873). H. A. N.

Geikie, James. The Great Ice-age and its Relation to the Antiquity of Man. 8vo. Lond. Pp. xxiii, 575, plates xvii, and 56 woodcuts.

The author adopts and illustrates in detail the generally received view as to the order of events in Britain during the last Glacial epoch: viz. that first there was a period of intense cold; then a milder period, during which the British Isles were submerged; and then a second cold period, less severe than the first. His new points are as follows:—He gives additional evidence of mild intervals during the first glaciation. He shows that there was a submergence of about 260 feet towards the end of the first cold period, and that, as the ice-sheet became broken up into separate glaciers, these brought down morainic rubbish, part of which was shot into the sea and formed the Upper Boulder Clay, as distinguished from the Till, of Scotland; part was shed on land. He believes also that many erratics were not carried by icebergs, but were dropped by the ice-sheet as it melted.

The great submergence of the country did not follow immediately on the disappearance of the ice-sheet; there was an interval, during which great masses of gravel were piled up *on land* by floods produced by the melting of the ice. Then began the great submergence, during which these gravels were rearranged by the sea, and Kames were formed.

On the question of the antiquity of man, the author insists on the absence of any traces of a transition from the Palæolithic to the Neolithic period; and accounts for this break by showing that there is reason to believe that Palæolithic man lived in Britain during the warm intervals of the first cold period, that he was driven out by the submergence, and that the country was repeopled by Neolithic men after the second glaciation had passed away.

Other points illustrated are Mr. Croll's theory of the cause of changes in climate, Prof. Ramsay's theory of the origin of Lake-basins, and Postglacial geology. The Drifts of Britain are compared with those of Scandinavia, Switzerland, and N. America. A. H. G.

Geikie, James. Note on the occurrence of Erratics at higher levels than the Rock-masses from which they have been derived. Trans. Geol. Soc. Glasgow, vol. iv. part 3, pp. 235–241.

An explanation of the phenomenon in question, based on the fact that the loss in height sustained by a glacier by melting and evaporation at the surface is made good by new supplies of ice from behind. Blocks imbedded in the ice are thus carried along a line dipping at a less angle than that of the valley; and where obstructions impede the flow of the glacier, the lines of ejection will not only become horizontal, but will even curve upwards; and boulders may thus be extruded at a level higher than that of their starting point. G. A. L.

Goodchild, J. G. On Drift. Geol. Mag. dec. 2, vol. i. pp. 496–510.

The object is to discuss the origin of glacial beds. The difficulties in the way of accepting them as submarine are so great that this theory is but barely alluded to. The general idea is that the Till was accumulated in sheltered places, *under* the moving ice-sheet or glacier. Some objections to this are stated; and it is suggested that the mud, stones, &c. may have accumulated *in* the ice-sheet. Cross currents of ice often exist, and the flow at the surface may sometimes be in the opposite direction to that at the bottom. We may thus account for many apparently anomalous phenomena, as, for instance, the occurrence of Lake-District rocks in the Drift of Galloway, whilst boulders from Galloway occur in the Drift of the Lake District. At the commencement of the ice-period, glaciers ploughed up the bottom of the Irish sea, and carried with them the accumulated marine remains of previous periods. These became subsequently imbedded in the ice-sheet, and were carried in the direction in which it moved. The paper enters into details as to how the various kinds of Drift (till, laminated clay, eskers, &c.) may have been formed from the débris included within the body of the ice-sheet. W. T.

Goulding, F. R. Directions of Frost-striations in Mud. Amer. Journ. ser. 3, vol. vii. p. 245.

Notices variations in the direction of frost-striæ over limestone and granite subsoils respectively, the direction being at right angles to the strike of the rocks. No explanation is attempted. G. A. L.

Heim, A. Om Gletscherrörelsensteori. [Theory of glacier-motion.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 257–271.

A version in Swedish of Dr. Heim's paper on this subject contributed to the publications of the Swiss Alpine Club. The theories of Scheuchzer Hugi, Grad, Agassiz, Moseley, Croll, Forbes, Ball, Rendu, J. Thomson, Tyndall, Biaconi and Matthews, Helmholz, Tresca, and Albert Heim (ranging from 1733–1870) are summarized in the above order.

G. A. L.

Heim, A. Einiges über die Verwitterung der Berge. [Weathering of mountains.] Neujahrsblatt, Zurich.

Assigns the denudation of mountains to the action of wind, lightning, rain, vegetation, and variations of temperature. The effect of these upon the different kind of rocks is examined. G. A. L.

Helland, Amund. Om Mægtigheden af Bræerne i Norge under Istiden. [Thickness of the glaciers of Norway during the Glacial period.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 168–177.

Describes the appearance of Norway during the glacial epoch thus:— The fjords were filled with glaciers, which attained a height of 1700 to 1800 metres in the Sogne Fjord, and 1200 metres in Hardanger Fjord. The tributary fjords contained glaciers as much as 800 metres in thickness. The nevé extended to or covered mountain-peaks 1700 or 1800 metres high in the Inletinden, and yet higher up the Tron-fjeldet and Rendals-Sölen, and had at least a thickness of 800 to 1100 metres. The ice-mass also covered South-eastern Norway, where it had a thickness of at least 600 to 700 metres. E. E.

Henderson, John. On glacial phenomena in the Pentland Hills, and at Tynecastle, near Edinburgh. Trans. Edin. Geol. Soc. vol. ii. part 3, pp. 360–367.

Discusses various points connected with Glacial theories, as illustrated by phenomena in the neighbourhood of Edinburgh.

Igelström, L. J. Exempel på flyttblock, som ligga högre än deras moderklyft. [Example of a boulder lying higher than its mother rock.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 151, 152.

Note of occurrence west of Krappa, in Wermland.

Jespersen, M. Åsar. Geol. Mag. dec. 2, vol. i. p. 574.

Thinks that the melting of an ice-sheet will go on fastest when the ice passes over depressions in the ground, specially those with running water, and that towards such places there would be a flowing in of the ice around to make good the loss; so that much detritus would be accumulated at such spots, either at the bottom, or in the ice, or on its surface. This detritus is carried on by the motion of the ice-sheet, to be finally heaped up as ridges (åsar) along the course the whole has taken. Allows also that some åsar are banks heaped up by the sea along old coast-lines. A. H. G.

Kjerulf, Prof. Theodor. Om Jaettegryder. [On Giants' Kettles.] Foredrag paa det 11 Skand. Naturforskermöde Kjöbenhavn, 1873. With plate and map.

Kettles in the valley of the Gula river (South Trondhjem), three of which are grouped 323 feet over the present rivercourse, are first described and considered, even in these extreme cases, as suggestive of river-action. From these the author turns to others at Kongshavn, near Christiania, entirely dissociated from any considerable waterflow. The theory is accepted by which the original water-power is sought during the prevalence of an ice-sheet, subject to temporary meltings, a theory supported by the travelled nature of the contents of the kettles. Their site, however, was under water at the decline of the ice-period. H. M.

LENZ, Dr. OSCAR. Notizen über den alten Gletscher des Rheinthales. [The old Glacier of the Rhine valley.] Jahrb. k.-k. geol. Reichs. Bd. xxiv. Heft 3, pp. 325–332.

A few detached notes on glacial occurrences in parts of the valley above the Lake of Constance (see also p. 77).

LEVIN, P. A. Tankar om de skandinaviska sandåsarnes bildning. [Formation of the Scandinavian sand-ridges.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 50–55.

MILNE-HOME, Dr. DAVID. Notice of a striated Boulder lately found in a Sand-pit at Tynecastle, near Edinburgh. Trans. Edin. Geol. Soc. vol. ii. part 3, pp. 347–350, with plate.

Describes a remarkable basaltic boulder, estimated to weigh nearly three tons, found in stratified sand and gravel.

——. Notice of a striated Boulder found at Drylaw, near Linton, East Lothian. Trans. Edin. Geol. Soc. vol. ii. part 3, pp. 350, 351.

Notes the characters of a large greenstone boulder in the Boulder Clay.

MUIR, JOHN. On Mountain Sculpture in the Sierra Nevada, and the method of glacial erosion. Amer. Journ. ser. 3, vol. vii. pp. 515, 516. (Entered by mistake as by E. S. CARR. See vol. viii. p. 80.)

Excerpts from the 'Overland Monthly,' May 1874.

MÜLLER, ALEXANDER. Ueber Thalbildung durch Gletscher. [Formation of valleys by glaciers.] Pogg. Ann. Bd. clii. pp. 476–482.

A reply to Dr. Pfaff's objections (see p. 179).

MURPHY, T. T. Presidential Address on some Questions in Cosmological Science. Proc. Belfast Nat. Hist. & Phil. Soc. 1872–73, pp. 1–19.

A summary of the recent views on Cosmogony. The author upholds the view that the Glacial epoch was caused by a decrease in the heat of the summers, not by an intensity of the cold of winter. A. H. G.

PATTERSEN, K. Arctis. Et bidrag til belysning af fordelingen mellem hav og land i den europæiske glacialtid. [Arctis. An attempt to elucidate the question of the distribution of land and water during the glacial period of Europe.] Geol. fören. Stockholm Förhandl. bdt. ii. p. 134.

The author's theory is that the glacial age of Scandinavia should be ascribed to the presence of an extensive continent, "Arctis," situated at some distance from the present coast of Norway, between Scotland and Spitzbergen, in consequence of which the warm gulf-stream was excluded from the Norwegian coast, and also from the Arctic Ocean between Spitzbergen and Nova Zembla. Gradually the "Arctis" land sank, so that, at length, a passage was opened for the gulf-stream from the Atlantic to the North Sea, and thence to the coast of Norway and the Arctic Ocean, as in the present day. E. E.

Pfaff, Dr. F. Ueber die Bewegung und Wirkung der Gletscher. [Motion and action of glaciers.] Pogg. Ann. Bd. cli. pp. 325–336 (woodcut), and Sitzungsb. phys.-med. Soc. Erlangen, Heft vi. pp. 34–44.

Discusses the laws of the motion of glaciers, describes experiments with the author's microgoniometer on the Aletsch glacier, and argues against the theory of the formation of valleys by glacial erosion. F. W. R.

Picton, J. A. Notes on the Phenomena of Glacial Action in Norway. Proc. Liverpool Geol. Soc. session 15, pp. 19–46.

Describes observed cases of the alternate advance and retreat of Norwegian glaciers and other glacial phenomena. Refers to Prof. Forbes's observations and to Prof. Esmark's descriptions, translated in Edin. New Phil. Journ. 1827. Quotes from a paper, "La Nevé de Justedal et les Glaciers," 1870, by M. de Seur, wherein the production of the granular snow called "Firn" is explained. The production of Giants' Cauldrons is attributed to the arrest of a boulder at the base of a glacier, the onward motion of which caused the stone to rotate; and cavities on the mountains called "Bottener" are looked upon as half-finished cauldrons. C. E. De R.

Rae, Dr. John. On some Physical Properties of Ice; on the Transposition of Boulders from below to above the Ice; and on Mammoth-remains. Phil. Mag. ser. 4, vol. xlviii. pp. 56–61.

The finding boulders on the surface of ice does not prove that they have fallen or been deposited on it. When ice forms on a tidal shore the boulders that may be near low-water mark at first break through, but afterwards, as the ice thickens, become firmly fixed and at last completely enclosed in ice. In the spring, by thaw and evaporation, the upper surface (say 3 feet) is removed, and the boulders appear lying on the top. The last part describes how Mammoth-remains become imbedded, and why their heads are commonly turned to the south. The head sinks deeper and becomes enclosed, while the body swings to the currents, which, in Siberian rivers, is from the south. F. D.

Reade, T. M. Tidal action as a Geological cause. Proc. Liverpool Geol. Soc. session 15, pp. 50–72.

States that wind-waves have never been felt at greater depths than 10 fathoms, while the free tide-wave affects every particle down to the most profound depth. Argues that, contrary to the general opinion, denudation does go on over the bottom of deep seas by means of tidal currents. C. E. De R.

Révy, J. J. Hydraulics of Great Rivers. The Paraná, the Uruguay, and the La Plata Estuaries. London.

Richardson, Ralph. On River Denudation, with Observations on the course of the Esk at Hawthornden, the Muriestone Water, Midcalder, &c. Trans. Edin. Geol. Soc. vol. ii. part 3, p. 313, plate.

Adduces instances of the erosion of river-valleys by their contained streams. The paper is illustrated by a lithograph, showing the erosion caused by the river Esk at Hawthornden. H. A. N.

——. Notice of a Section in the Building Excavations at Tynecastle, West End, Edinburgh. Trans. Edin. Geol. Soc. vol. ii. part 3, pp. 358–360.

Describes a section of various glacial deposits (28 feet).

——. Notice of a large Quartz Boulder, called the "White Stone," in the town of Peebles. Trans. Edin. Geol. Soc. vol. ii. part 3, pp. 397–399.

Contains a description of the boulder and a record of its history.

Tardy, —. Les Glaciers et le Soleil. [Glaciers and the Sun.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 207, 208.

Note protesting against M. Vicaire's view that the Glacial period is to be explained by the cooling of the sun, resulting from its combustion. G. A. L.

——. Action de la Mer sur quelques Roches. [Action of the sea on some rocks.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 267, 268.

Believes that a certain blackish vitreous varnish, occasionally found coating hard rocks exposed to the weathering action of breakers, can be effected only by sea-water. G. A. L.

Törnebohm, A. E. Några amnörkningar med antedning af Dr. P. A. Levin's uppsats "Tankar om de skandinaviska sandåsarnes bildning." [Remarks on Dr. Levin's "Suggestions on the Formation of the Scandinavian Sand-ridges" (see p. 178.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 55–60, pl. iv.

——. Några iakttagelser med afseende på flyttblocken i Jemtland. [Erratics in Jemtland.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 80–84.

Account of observations as to the directions in which the erratic blocks of this region have been transported. G. A. L.

——. Om flyttblock och terrasser vid Rendals-Sölen i Norge. [Erratic blocks and terraces near Rendals-Sölen, in Norway.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 106–109.

Weiser, R. Permanent Ice in a Mine in the Rocky Mountains. Amer. Journ. ser. 3, vol. viii. pp. 477, 478.

The writer can only account for the production of this ice by falling "back upon the Glacial era of the Quaternary."

Willcox, T. Mountain drainage of Eastern Tenessee and Western North Carolina. Proc. Ac. Nat. Sci. Philadel. p. 165.

The country is bounded by a lofty range, the Blue Mountains, on the east, and by a range equally lofty, the Smoky Mountains, on the west. The streams flow to the west through deep gorges, cutting across the latter range. The Blue Mountains are of gneiss and probably the older range, and gave the initial direction of flow; the Smoky Mountains are of sedimentary rocks, and were probably upheaved afterwards, and as they rose the streams cut channels across them. A. H. G.

See also:—

Belt, T. Glacial action, Nicaragua: p. 111.
Bonney, Rev. T. G. U. Engadine &c. and Glacier-erosion Theory of Lake-basins: see Addenda.
Burbank, L. S. Glacial action, N. Carolina: p. 112.
Dobson, A. D. Glacial Period: p. 149.
Falsan. Old Glaciers of the Rhone: p. 61.
Hummel, D. Pebble-deposits (Åsars): p. 73.
Jamieson, T. F. Glacial Period, N. Britain: p. 21.
Kinahan, G. H. Glacialoid Drift: p. 24.
Lenz, Dr. O. Glacial Phenomena, Vorarlberg: p. 77.
Lucy, W. C. Glaciation in Somerset: p. 25.
Mackintosh, D. Glaciation in Somerset. Ice-sheet in N. Wales: p. 26.
Milne, J. Physical Features, Newfoundland: see Addenda.
Nathorst, A. G. Formation of Åsars, Gothland: p. 84.
Newberry, Prof. Origin of Lakes and Glacial Phenomena, Ohio: p. 125.
Parker, J. Valley of the Somme: p. 87.
Piette, E. Quaternary Glacier of the Garonne: p. 89.
Ramsay, Prof. A. C. Valley of the Rhine: p. 90.
Robert, E. Valleys of the Paris Basin: p. 92.
Sexe, S. A. Giants' Cauldrons: p. 95.
Stefani, C. de. Old Glaciers, N. Apennines &c.: p. 99.
Tardy, A. Quaternary Glaciers, Madelaine Hills, and Miocene Glaciers: p. 101.
Theobald, W. Former Glaciers, Kangra: p. 141.
Thomson, J. T. Glacial Action, N. Zealand: p. 158.
Travers, W. T. L. Extinct Glaciers, N. Zealand: p. 158.
Ward, J. C. Lake Basins, Cumberland: p. 39.
Woodward, H. B. Glaciation, Somerset &c.: pp. 42, 43.
Zittel. Glacial Phenomena, Bavaria: p. 106.

3. *ROCK-FORMATION.*

Durham, William. Suspension of Clay in Water. Chem. News, vol. xxx. no. 767, p. 57. Abstract of a paper read to Roy. Phys. Soc. Edin.

The power of water to hold clay in suspension is gradually destroyed by the addition of an acid or of common salt, while it is increased by the addition of small quantities of the alkalies or their carbonates and by lime.

[A letter signed "T. R. O." (no. 769, p. 97) calls attention to Dr. Sterry Hunt's observations on this subject, which are similar to those of Mr. Durham.] F. W. R.

Hunt, Dr. T. S. The Origin of Metalliferous Deposits. Trans. Amer. Inst. Min. Eng. vol. i. pp. 413–426.

Describes the various processes that have resulted in the formation of metalliferous deposits, which the author believes is now going on by means of the same agencies as during past times. W. W.

Kinahan, G. H. Peat Bogs. Quart. Journ. Sci. no. xliii. p. 294.

On the formation of peat-bogs and its bearing upon the origin of coal. The normal lowland or "red bogs" of the central plain of Ireland are generally supported by an underclay penetrated by roots of oak and yew. Above the "corkers" or roots of the oak comes a variable thickness of peat, and above that the remains of a pine forest, with the "corkers" in horizontal layers. Relics of human workmanship are found beneath the peat. Taking the case of Castleconnel bog, Co. Limerick, the author estimates that at least 5000 years must have elapsed since the oak-forest began to grow there. A. H. G.

Müller, Alexander. Die Rollsteinrücken. [Pebble-ridges.] Pogg. Ann. Bd. clii. pp. 482–484.

Suggests that ridges of pebbles may have been accumulated by submarine action when the shore was fringed with ice.

Robertson, David. Note on the Precipitation of Clay in Fresh and Salt water. Trans. Geol. Soc. Glasgow, vol. iv. part 3, pp. 257–259.

An account of some experiments which show that salt water has much greater power of precipitating clay than fresh water has, the difference being marked even between slightly brackish water and pure water. G. A. L.

Roper, F. C. S. What is Chalk? Papers Eastbourne Nat. Hist. Soc. 1873–74, pp. 7–9.

An account of the facts which have enabled scientific men to determine the origin of our chalk, leading to the conclusion that "the greater part of the mass is made up of Foraminifera, with coccoliths and coccospheres." W. W.

Thomson, Prof. W. The 'Challenger' Expedition. Nature, vol. xi. pp. 95 and 116.

Sand dredged in Agulhas current at 98–150 fathoms consisted of casts of Foraminifera in a silicate of alumina, potash, and iron, allied to Glauconite. A table of the nature of the bottom at 160 stations in the Atlantic and Southern Oceans shows that three different deposits were met with:—1st. Ordinary *Globigerina*-ooze, down to a mean maximum depth of 2250 fathoms. 2nd. Grey ooze, at a mean depth of 2400 fathoms. 3rd. Red clay, at 2700 fathoms and upwards. The author believes that as the *Globigerina*-shells sink slowly down from the surface, the carbonate of lime is dissolved out by carbonic acid, which is found in excess at great depths, and that the red clay is the insoluble residue. The grey ooze forms a transition from the *Globigerina*-ooze to the red clay. A. H. G.

Ward, Thomas. The great European Salt Deposits, with a Theory as to their Origin. Proc. Lit. & Phil. Soc. Liverpool, no. xxviii. pp. 163–187.

The chief salt-districts are noticed under 10 heads. The theory is that the salt-deposits "owe their origin entirely to the elevation of the mountain-chains with which they are so intimately connected," during which "small valleys and ravines would be cut off from connection with the sea by ridges of land, and would form salt lakes and lagoons." W. W.

Williamson, Prof. W. C. Deep-Sea Researches. Nature, vol. xi. p. 148.

States that the explanation given by Prof. W. Thomson of the origin of the Red Clay (see above) had been already suggested by himself. A. H. G.

Wilson, A. S. On some chemical aspects of Physical Geography. Chem. News, vol. xxx. no. 763, p. 14; no. 764, p. 26.

Clay and finely divided earthy matter have the power of absorbing various salts from solutions. The author thinks that compounds of ammonia may be thus removed from rain-water as it percolates through the soil, which thus becomes enriched while the water is purified. Fine river-sediment brings down with it salts of potash, ammonia, and phosphoric acid, derived from sewage and other impurities, whence the fertility of deltas and alluvial soils. The author also believes that the "red mud" dredged by the 'Challenger' is an incipient slate rock, and publishes three analyses of British slates. A. H. G.

4. COSMOGONY; MISCELLANEOUS.

Conrads, P. A. Grösse, Gestalt und Dichte der Erde. [The size, figure, and elements of the Earth.] 26 pp. 4to. Cologne.

Dawkins, W. B. The limits of our knowledge of the Earth. Essays and Addresses by Professors and Lecturers of the Owens College, Manchester. 31 pp. Lond.

From considerations based chiefly upon recent researches into the composition of meteorites and of igneous rocks, and upon the results of the application of spectrum-analysis to the study of the heavenly bodies, the author concludes "that the earth is united by the closest bonds to the heavenly bodies, and that terrestrial change is in a definite direction, in a straight line, so to speak, and not in a circle." He holds "that the forces in play on the surface in ancient times were stronger than they are now," and "that the earth can no more return to her ancient conditions than a man can return to his childhood." G. A. L.

Herschel, Prof. A. S., and G. A. **Lebour**. Notes of some Experiments on the Conducting-powers for Heat of certain rocks &c. Rep. Brit. Assoc., Sections, p. 223.

The authors have as yet made only preliminary observations; but these establish the general *bad* conducting-power of rocks, and in some cases confirm the numerical results obtained by Peclet. A. H. G.

Howarth, H. H. Does the Earth receive any thing directly from the sun? Mem. Lit. and Phil. Soc. Manchester, vol. xiii. pp. 131–140.

Jannettaz, **Ed.** Sur la conductibilité thermique dans les roches et dans les corps en général. [Thermal conductivity of rocks.] Compt. Rend. t. lxxviii. pp. 1202–1205.

When a point of the surface of a rock is heated, the curves representing the propagation of the heat around that point are, when in the planes of foliation or cleavage, circular, when at right-angles to such planes elliptic, the longer axis of the ellipse being aways parallel to the intersections of the heated face and the foliation-planes. The relations between the long and short axes in the various rocks experimented on are given. A summary, with special reference to schistose rocks, is to be found in Bull. Soc. Géol. France, 3 sér. t. ii. pp. 264–267. G. A. L.

Proctor, R. A. The Past and Future of our Earth. Contemporary Review, vol. xxv. p. 74.

Taylor, **Andrew**. On the probability of our successfully calculating the Antiquity of the Earth. Trans. Edin. Geol. Soc. vol. ii. part 3, pp. 402-411.

Summarizes the chief data whereby we may ultimately be enabled to arrive at an approximate calculation as to the antiquity of the earth.

Thomson, Sir **William**. Influences of Geological Changes on the Earth's Rotation. (President's Address.) Trans. Geol. Soc. Glasgow, vol. iv. part 3, pp. 311–313 (abstract).

Topley, W. Areas of Apparent Upheaval and Thickening of Subjacent Beds. See p. 37.

Vicaire, E. Sur la constitution physique du Soleil dans ses rapports avec la géologie. [Physical structure of the sun with reference to geology.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 211–219.

A paper on solar physics. The author regards the mineral oils of America &c. as matter of primordial origin, " witnesses of the stellar age of the earth, which have escaped the general conflagration of that epoch." He denies the possibility of great glacial epochs in ancient geological times, although he admits that glaciers may have existed then as now. G. A. L.

Wiebel, K. W. M. Die Insel Kephalonia und die Meermühlen von Argostoli. Versuch einer Lösung dieses geophysikalischen Räthsels. 4to. Hamburg. Pp. ix, 160; map, sections, and woodcuts.

APPLIED AND ECONOMIC GEOLOGY.

Alexander, Major-Gen. Sir J. On the Use and Abuse of Peat. Rep. Brit. Assoc. for 1873, Sections, p. 183.

The character and uses of peat are described, reference being made to the peat of Shetland, France, the Falkland Islands, and Canada.

Anon. Peat. Journ. Soc. Arts, vol. xxii. no. 1098, pp. 50–53.

Treats of the economic value of peat, its different qualities, the methods of raising it, &c.

——. Notes on the Iron and Steel Industries of the United Kingdom. Journ. Iron and Steel Inst. no. 1, pp. 242–280; no. 2, pp. 475–502.

——. The Building-Limestones of France. The Architect, vol. xii. nos. 298–301, pp. 128, 129, 139–141, 155–157, 168, 169.

Notices the geological and geographical distribution of the stones, and explains many technical terms. The question of the decay of building-stones is discussed.

——. The Channel Tunnel: or Submarine Railway between England and France. Statement by the Committee of the Channel Tunnel Company. 8vo. Lond. Pp. 17, plate (map, showing position of borings in the sea-bed, and geological section).

Geological notes on pp. 5–11, chiefly reprinted from earlier notices.

——. The search for Coal at Sandwell Park, West Bromwich. Coll. Guard. vol. xxvii. pp. 11, 355, 422, 424, 532, 783, 820, 893, vol. xxviii. pp. 94, 570.

Notes and articles giving accounts of progress. The "Brooch" coal was struck at 380 yards, below this came the "Herring" coal. The Thick coal was 20½ feet in thickness. The dip is east, about 5 inches in a yard. The "Heathen" coal was next proved, and at 5 yards below it was found the white ironstone, of excellent quality and large yield.
G. A. L.

——. Mining Operations in County Down, Ireland. Coll. Guard. vol. xxvii. p. 247.

A note of the alleged discovery of a 6-foot seam of coal in the townland of Ringalloy, on the borders of Strangford Lough.

——. North Staffordshire Coal-field. Coll. Guard. vol. xxvii. p. 748.

Note of the discovery of a seam of hard mine-coal, 4 feet 2 inches thick, of superior quality, by the Chatterley Company, at their Moss Colliery, Bucknall. G. A. L.

Anon. Extraordinary Development of the Yorkshire Coal-field. Coll. Guard. vol. xxvii. p. 756.

Account of new collieries recently opened in Yorkshire.

——. Another Discovery of Coal near Leicester. Coll. Guard. vol. xxvii. p. 757.

Account of a boring at Lindridge, 7 miles W. of Leicester, began in the New Red Marls and carried to a depth of 300 feet. Two coal-seams have been pierced, 2 feet and 7 feet thick. G. A. L.

——. Discovery of a Coal-seam at Gateshead. Coll. Guard. vol. xxvii. p. 757.

Note of the discovery of a 4½-feet coal-seam, at 25 fathoms from the surface, in sinking the Atkinson shaft of Redheugh Colliery.

——. Discovery of Coal in South Staffordshire. Coll. Guard. vol. xxviii. pp. 129, 133.

Articles on the sinkings at Lye Cross, which, after passing through 60 yards of Rowley Rag, have struck all the "measures" of S. Staffordshire from the 2-foot and brooch coal to the bottom coal, including the thick coal, here 29 feet thick. G. A. L.

——. Iron and Coal in India. Iron, vol. iv. p. 422.

——. The Mineral Wealth of Peru. Iron, vol. iv. p. 423.

——. The Iron Ores of Labrador. Iron, vol. iv. p. 423.

Bidwell, C. Coprolites. Trans. Inst. Surveyors, vol. vi. pp. 293–310; Discussion, pp. 311–322.

The paper opens with a discussion on the probable mode of origin of phosphatic nodules, in the course of which frequent references are made to previously published opinions. The remainder of the paper is devoted to a description of the works in Cambridgshire. The produce per acre varies from 150 to 400 tons, at Wicken it is 2000. Details are given as to the mode of working and washing the nodules. Analyses, by Dr. A. Voelcker, are appended. W. T.

Bower, John A. Whitby Jet and its Manufacture. Journ. Soc. Arts, vol. xxii. no. 1100, pp. 80–87.

The author thinks that jet is not simply a lignite, but that it has been formed as a distillate from the containing rock. It was originally got for the most part along the cliffs; but these workings are now nearly abandoned, and the chief are on the hill-sides in the Cleveland district. The methods of getting the jet and of working it into ornaments are described. W. W.

Brigg, John. On such of the Industries of Bradford as relate to its Geological Position. Rep. Brit. Assoc. for 1874, Sections, pp. 76, 77; published in full under the title "The Industrial Geology of Bradford." 8vo. Leeds. Pp. 18.

The principal building-stones of the district are, the coarse sandstone

known as the "Rough Rock," which is the highest member of the Millstone Grit series, and the fine-grained flagstones which occur in the Lower Coal Measures. The flagstones are also used for roofing. "Calliard," or "Gannister," is a hard siliceous rock in the Lower Coal Measures, associated with the Halifax Hard Bed and Halifax Soft Bed (coals); beneath the former the Gannister sometimes changes into fire-clay. The chief bed of fire-clay is that beneath the Halifax Hard Coal; it is 5½ feet thick. The range, thickness, and character of the Coal-seams are given; and especial notice is taken of the Low-Moor Coal and Ironstone. The water-supply of the district is noticed.
W. T.

Brooks, Major T. B. The Method and Cost of Mining the Red Specular and Magnetic Ores of the Marquette Iron Region of Lake Superior. Trans. Amer. Inst. Min. Eng. vol. i. pp. 193–203.

The iron-bearing rocks are Huronian, and have been contorted. A section of Lake Superior Mine is given.

Burat, Amédée. Applications de Géologie à l'Agriculture. Paris.

The first chapter is a general description of the physical character and composition of soils, the third is on water, and the fourth on the connexion between geology and agriculture. C. E. De R.

Burthe, P. L. Notice sur les minerais de plomb argentifère de l'Utah, et leur traitement métallurgique en 1873. [Argentiferous Lead Ores in Utah, &c.] 37 pp., plate. Ann. d. Mines, sér. 7, vol. v.

The rocks in which the lodes are situated are thick beds of grit and two series of dolomites, resting on a fine-grained very regularly *bedded* granite. The grits have assumed the appearance of quartzites, and the dolomitic limestones are in places coarsely crystalline. The age of the sedimentary rocks is not settled yet, some regarding them as Carboniferous, others as Devonian; they are traversed by several dioritic dykes. The more important lodes occur at the junction of the quartzite grits with the second dolomitic band, but others are found in the granite. G. A. L.

——. Notice sur les gisements des minerais d'argent, leur exploitation et leur traitement métallurgique aux Etats-Unis. (Première partie.) [Silver Ores in the United States.] 112 pp., 3 plates. Ann. des Mines, sér. 7, vol. v.

This part comprises detailed descriptions of the mining districts of Utah and adjoining territories, including the modes of working. The lodes described are those of Comstock, of Austin (Nevada), of Gilpin County and Clear Creek County (Colorado). These lodes are chiefly argentiferous: those of Comstock are at the junction of the syenite and greenstone; those of Colorado are in granite and gneiss, in more or less vertical positions; while those of Austin lie in the granite in more or less horizontal planes. The plates are plans of the workings, showing the position, hade, proved extent, dislocations, and points of richness of each vein. G. A. L.

Cleve, P. T. Om Stenkol, deras uppkomst, utbredning och betydelse. [Coal, its origin, distribution, and importance.] Second edition of 'Ur vår tids forskning,' pt. i. 8vo. Stockholm. Pp. 1–60, 17 illustrations.

A general account of coal from a geological, mining, and commercial point of view. The article on the Coal-field of Scania, by E. Erdmann, is noticed at p. 60. G. A. L.

Corfield, Dr. W. H. Lectures delivered at the School of Military Engineering, Chatham, on Water Supply, &c. Fol. Chatham, 1874. (Printed for private circulation.)

Lecture 1. Chemical qualities of water. Lecture 2. Wells and springs and the water-bearing formations of England.

Diaze, Vice-Consul. Report on the Trade and Commerce of Huelva for the year 1872. Reports from Her Majesty's Consuls, Commercial No. 5 (1874), part i. 8vo. Pp. 279–288.

Notes on the produce of pyrites, copper, and manganese. The most important mines of the district are Tharsis, Calañas, Lagunazo, Lapilla, Buitron, and Sotiel. W. T.

Dibos, E. Les puits artésiens en Algérie. [Artesian wells in Algeria.] Rev. mar. et col. pp. 10–14.

Erdmann, Edw. Om borrning efter stenkol. [On boring for coal.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 130–138, plates xi., xii.

Discusses the processes of reasoning involved in proving the seams of a coal-field by borings, and gives many details of the dips and thicknesses of the coal-seams in Scania and elsewhere as illustrations. The thinning and changes of seams and their accompanying beds are explained and illustrated. G. A. L.

Firket, Ad. Carte de la production, de la consommation et de la circulation des minerais de fer, de zinc, de plomb et des pyrites en Belgique, pendant l'année 1871. 1 sheet, scale $\frac{1}{300,000}$. Brussels.

——. Note on the above. 12 pp. Liège.

Gerstel, G. [On the Drainage of Clay Mountains.] Allgemeine Bauzeitung, nos. 1–4, 32 cols. 4 pl.

Gives an account of the means adopted to prevent slips during the construction of the Schässburg-Kronstadt line of the East Hungarian railway. The beds traversed are of Tertiary age; they consist of loam, calcareous clay, and grey marly clay, the whole resting on a stiff blue clay (Tegel) of small dip and undetermined depth. The yellow clay cracks very much in dry weather; water finds its way down to the surface of the blue clay, and over this bed the higher strata slip. (From abstract in Proc. Inst. Civ. Eng.)

Gott, C. On the Bradford Waterworks. Rep. Brit. Assoc. for 1873, pp. 451–458.

Some notes are given of the gathering-grounds, and of the relation of the strata and springs to the reservoirs.

Grosjean, —. Ressources houillères de la France. [Coal resources of France.] Compt. Rend. 2 sess. Assoc. Franç. pp. 364–369:

A discussion on the produce and probable duration of French coal.

Hahn, O. H., A. **Eilers**, and Dr. R. W. **Raymond**. The Smelting of Argentiferous Lead Ores in Nevada, Utah, and Montana. Trans. Amer. Inst. Min. Eng. vol. i. p. 91.

Contains references to materials, ores, &c.

Harden, J. W. The Longwall System of Mining. Trans. Amer. Inst. Min. Eng. vol. i. p. 300.

Refers to the Warwickshire coal-field, pp. 302, 303.

Hardman, **Edward** T. On the present State of Coal Mining in the County of Tyrone. Journ. Roy. Dublin Soc. vol. vi. no. 42, pp. 366–383, plate and two woodcuts; Discussion, pp. 457, 458.

There are two coal-fields; the larger, although small, contains 18 seams, from 10 inches to 9 feet in thickness, which have been worked, including two of excellent cannel. The lowest seams occur near Dungannon, in hard beds, which answers to the Gannister beds of England. The upper series is found around Coal Island, in very soft beds, with thick layers of fire-clay and shales containing clay-ironstone, and there are 10 seams of a yard and upwards in thickness. The coal-field is bounded on the north-west by a large fault, but on the east are Triassic rocks, underneath which the Coal Measures extend. A good deal of the coal has been wrought out; but there remains a total available supply of between 30 and 40 millions of tons, estimating only coals of a yard and upwards thick, and many of the seams are of good quality. The smaller coal-field at Annaghone, some miles north, has an area of about 250 acres, and contains three coals, two of which, 3 and 9 feet thick, are of good quality. E. T. H.

Harriss-Gastrel, —. Report on the Iron and Steel Industries of the United States. Reports by Her Majesty's Secretaries of Embassy and Legation, Commercial No. 18 (1874), part ii. 8vo. Pp. 129–316.

Details are given of analyses, production, method, and cost of working, &c. of the chief iron-producing districts. This part of the report (pp. 131 to 198) is divided into the following heads:—Lake Superior region, Missouri region, Lake Champlain region, region of southern ores, Pennsylvania region. Statistics and a general review of ores are appended. W. T.

Heatherington, A. The Mining Industries of Nova Scotia. Pp. 23. London.

Herter, Paul. Zeit. deutsch. geol. Gesel. Bd. xxvi. Heft 4, pp. 935–937.

Letter on the recent progress of mining in Tuscany.

Hill, J. S., and W. Fairley. The Coal Deposits of Great Britain, and the Oolitic Coal of England, Scotland, Sweden, and Denmark. Coll. Guard. vol. xxviii. pp. 670, 705, 743, 815, 851, 887, 923.

A compilation chiefly from German sources.

Hochstetter, F. Von. Geologie und Eisenbahnbau. [Geology and Railways.] Vienna.

Inaugural address as rector of the Imperial Technical High School of Vienna.

Kühn, H. [Amber mine in East Prussia.] Zeitsch. Berg-Hütten und Salinenwesen, xxii. parts 3 and 4, pp. 139–146.

Shafts are being sunk through Tertiary beds near Königsberg. The amber-bearing bed is found at a depth of 140 feet at Nortyken, in Samland. H. B.

Lapparent, A. de. Note sur l'ouvrage de M. Moissenet, intitulé: Parties riches des Filons. [On M. Moissenet's work on the rich portions of veins.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 82–85.

Leon, E. de. The Mineral Resources of the Southern States of the American Union. Iron, vol. iv. pp. 674, 706.

Lucas, J. Horizontal Wells. A new Application of Geological Principles to effect the Solution of the Problem of Supplying London with Pure Water. 4to. Lond. pp. viii, 86, 2 maps and 3 plates. [A list of *Errata*, 2 pp., was issued separately.]

Pp. 1–15 give an account of the quality of the water supplied to London, especially during 1872 and 1873. The author next treats of the origin of springs and the subterranean levels of waters. He proposes to intercept the water at the various water-bearing beds by means of galleries, and to convey this water to London by gravitation. The chief sources are the Chalk and the base of the Hythe Beds. Much information is given as to the rainfall, yield, and quality of springs, percolation, underground level of water, &c. This is collected in the Tables on pp. 65–83. The result of the author's observations, and his mode of making them, are given in the Appendix, pp. 49–64. W. T.

Macadam, Dr. Stevenson. On Water Supply. Proc. Phil. Soc. Glasgow, vol. ix. no. 1, p. 23.

Nature of gathering-ground treated of pp. 31–33, but with reference to contamination only.

M'Kellar, Peter. Mining on the North Shore of Lake Superior. Pp. 26. Toronto, 1874.

The author gives a general account of the rise and progress of mining on the north shore of Lake Superior, with detailed statistics as to the produce of the existing mines. H. A. N.

Malmros, V. Anteckningar öfver Carl XV.'s koppapgrufva. [The Carl XV.'s Copper Mine.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 109–112, pl. viii.

This mine is in the parish of Fröderid, in the province of Jönköping. The rocks are quartz, granular limestone, hornblendic and chloritic schists. The yield in copper and silver is given. G. A. L.

Manck, —. [Observations on Subterranean Water in Dresden.] Protokolle des Sächsischen Ingenieur-Vereins, Sept. 1874, pp. 4–9.

A series of observations were made in 92 wells, to determine the varying levels of the water as compared with that in the Elbe. The subsoil on the right bank is fine gravel and sand; on the left bank coarse gravel and pebbles. The impervious beds below consist mainly of ragstone, at depths varying from 39 to 54 feet. The variations in level were most sudden in the coarse gravel. The rate at which water flows from one district to another is ascertained, and it is now possible to localize contamination and to point with precision to its source. Some pumps in the midst of the old city give very pure water; the level there is low and the soil very fine. (From an abstract in 'Proc. Inst. Civ. Eng.' vol. xxxix. pp. 369, 370.)

Maw, W. H., and J. **Dredge**. Report on "Mineral Fuel," appended to 'Reports on the Vienna Universal Exhibition of 1873.' Part II. 8vo. Pp. 353–371.

——, ——. Report on "Building Material." Ibid. Part III. Pp. 388–407.

——, ——. Report on "Iron and Steel." Ibid. Part III. Pp. 408–518.

Meade, R. The Iron Industries of Northamptonshire. Mining Journ., Dec. 5.

——. The Iron Industries of the North Riding of Yorkshire (Cleveland district). Mining Journ., Dec. 19.

Meadows, J. M'C. Peat-Fuel Machinery. Proc. Inst. Civ. Eng. vol. xxxviii. pp. 249–260; Discussion, pp. 261–282.

Notes are given on the value of peat for fuel, and further information upon the subject is contained in the discussion, including a detailed account of the results obtained in Bavaria. W. T.

Neill, A. On the Bradford Building Trades. Rep. Brit. Assoc. for 1873, Sections pp. 196–199.

——. On Stone-dressing in Bradford. Ibid. p. 214.

The author described the building-stones of the district, the methods of working them, the cost, &c.

Neville, P. On the Water-supply of the City of Dublin. Proc. Inst. Civ. Eng. vol. xxxviii. pp. 1–43 (Discussion, pp. 44–49).

Dublin and the neighbourhood is now supplied, by gravitation-works, with water from the Cambrian and Silurian rocks to the south. There is now but little peat left in the district. The paper contains an analysis of the water, and notes upon the construction of a tunnel, 4332 yards long, through rocks of varying character. W. T.

Nordenström, O. G. Bidrag till kännedomen om Dalkarlsbergs malmfält. [Contributions to a knowledge of the metalliferous field of Dalkarlsberg.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 27, 28, pl. iii.

Description of the workings.

——. Om vigten af geologisk kunskap vid malmfyndigheters uppsökande. [On the importance of geological skill in discovering ore-deposits.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 61–63, fig. in text.

As an instance the arrangement of iron- and copper-ores at Åtvidaberg is given, showing their relations to the country-rock, which consists of granite, gneiss, hornblende-rock, mica-schist, and protogine gneiss. G. A. L.

——. Iakttagelser rörande Solstads koppargrufva. [Solstad copper-mine.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 116–120, pls. v.–vii.

A plan, showing the mine at 13 different levels (the deepest being 1000 Swedish feet), is given on a scale of 1:1200. Two sections are likewise given. The rocks met with in the workings are gneiss, grey quartz, and trap in dykes. The gneiss is the country-rock, the vein being filled up with the quartz and the ore. The hade of the vein is irregular, but on the whole south-westerly. G. A. L.

Oxland, Dr. R. Lime. Trans. Plymouth Inst. vol. v. part 1, pp. 54, 55 (abstract).

Mentions some of the economic uses of limestone.

Page, Prof. D. [Remarks on some specimens of Artificial Stones.] Trans. N. Engl. Inst. Eng. vol. xxiii. pp. 158–160.

Refers to Chance's Patent Stone, formerly made near Birmingham by melting Rowley Rag; and Ransome's Patent Stone, prepared from ground flints and a siliceous rock [Upper Greensand] from Farnham, which contains silica soluble in caustic soda. W. T.

——. Economic Geology, or Geology in its relations to the Arts and Manufactures. 8vo. Edin. and Lond. Pp. xv, 336. 18 woodcuts and geol. map of the British Isles (scale 60 miles to 1 inch), by A. K. Johnstone [map reprinted from Keith Johnstone's School Physical Atlas, 1869].

The author divides his work as follows:—Introduction, 7 pp.; the Rocky Crust, 23 pp.; Agriculture, 18 pp.; Land Valuation, 8 pp.; Architecture, 47 pp.; Civil Engineering, 16 pp.; Mine Engineering, 26 pp.; Heat- and Light-producing materials, 26 pp.; Fictile Arts, 13 pp.; Grinding, Whetting, and Polishing materials, 13 pp.; Refractory or Fire-resisting substances, 9 pp.; Pigments, Dyes, and Detergents, 9 pp.; Salts and Saline Earths, 14 pp.; Mineral and Thermal Springs, 19 pp.; Mineral Medicines, 4 pp.; Gems and Precious Stones, 20 pp.; Metals and Metallic Ores, 38 pp.; General Summary, 10 pp. A few general references to authorities are given at the end of each chapter. W. T.

PAGET, F. A. Report on the Utilization of Peat and Peat-lands. Reports on the Vienna Universal Exhibition of 1873. Part II. 8vo. Pp. 269-249. 2 plates and woodcuts.

The subject is treated under the following heads:—Natural Formation and Growth; Extraction and Winning; Mixing and Condensing; Drying; Carbonization or Charring; Products of its Distillation; Applications as a Fuel; Reclamation of Peat-lands; Sundry Applications of Peat. W. T.

PARODI, —. On Sulphur in Sicily. Nature, vol. x. p. 271.

Believes the sulphur of Sicily will be exhausted in 50 or 60 years; but as no sulphur has yet been worked below 400 ft., this estimate is doubtful. C. E. DE R.

PLANT, JOHN. Peat Fuels and their Economic Value. Trans. Manchester Geol. Soc. vol. xiii. part 3, pp. 55-82.

Describes the peat of highlands as never reaching more than 6 feet, while those of lowland bogs reach 50 to 80. Takes peat-mosses of Great Britain to cover 3½ million acres, which with those of Ireland gives 6 million acres. In Holland 40 million tons of hard peat-fuel are made. Peat is then divided into four classes:—"long turf," from high fens, fibrous and light; "short turf," obtained by dredging the water-covered turbaries, cut into short bricks; "derric turf," obtained from under the sand-dunes on the coast; and "Rahder turf," a machine-made peat-fuel. C. E. DE R.

POOLE, H. S. Report of the Department of Mines, Nova Scotia, for the year 1873. Pp. 88. Halifax.

SALBACH, —. [Dresden Waterworks.] Protokolle des Sächsischen Ingenieur-Vereins, May 10, 1874, pp. 17-41, 1 pl.

In the valley of the Elbe there are large tracts of thick, clean, fine sand, such as that forming Dresden Heath; this sand overlies granite and other formations. There are but few springs; and borings made on the summit and slope of the Heath showed that but a small quantity of water could be there obtained. Experiments were then made to see if it would be possible to supply Dresden with naturally filtered water, taken from the banks of the river. These experiments showed that a large number of subterranean watercourses on the slope of the Heath run into the gravel of the Elbe valley, and continue their course under the bed of the river. A shaft, 23 feet deep, was sunk in the bank of the river, from which 11 million gallons are pumped daily.

By pumping, the water in the shaft is kept 8 feet below the level of the river; yet the water of the shaft and that of the river differ in temperature and quality, showing that there is no connexion between them. Analyses of the water are given. The permanent works consist of wells and a gallery, driven to intercept the subterranean watercourses. (From abstract in Proc. Inst. Civ. Eng. vol. xxxix. pp. 383–386.)

W. T.

Sjögren, A. Anteckningar i praktisk geognosi. I. Om nyttan och nödvändigheten af att å grufkartorna noggrannt angifva bergarterna. [Suggestions in practical geology. On the usefulness and necessity of accurately mapping the rocks in mining plans.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 169–174, pl. xvi.

As an instance gives a description, with figures, of the "Stor" or great mines near Persberg.

Smith, E. J. Agricultural Geology (No. 2. Northern Division). Trans. Inst. Surveyors, vol. vi. pp. 323–341 (Discussion, pp. 341, 342).

Describes the range, elevation, soils, mineral products, &c. of the Palæozoic rocks in the northern counties.

Smyth, W. W. Address of the President for 1872. 59th and 60th Ann. Reps. Roy. Cornwall Geol. Soc. pp. 7–15.

Points out the lines of inquiry for members.

——. Address of the President for 1873. Ibid. pp. 31–42.

Shows that there is no reason for saying that the mineral treasures of Cornwall are exhausted, whether from want of new discoveries or from the depth of the mines, and refers to discoveries of tin in Australia and Van Diemen's Land, and the reworking of lead-slags at Laurium in Greece.

C. Le N. F.

Squarey, E. P. Agricultural Geology. Trans. Inst. Surveyors, vol. vi. pp. 9–23 (Discussion, pp. 23–46).

Describes the soils overlying the various formations in England and Wales, dealing chiefly with the Secondary and Tertiary rocks.

Voelcker, Dr. A. On the Composition of Waters of Land Drainage. Journ. Roy. Agric. Soc., ser. 2, vol. x. pp. 132–165.

Gives analyses of 70 samples of water from Broadbalk Field, Rothampsted.

Vom Rath, —. [Sulphur in Sicily &c.] N. Jahrb. Heft i. pp. 62–66.

A letter enclosing extract from Prof. Trautschold, of Moscow, on the treatment of sulphur at Lercara, and on the industries of the Lipari Isles. Vom Rath adds a description of Vulcano.

F. W. R.

Wikoff, Hon. A. L. Ohio Statistics for 1873. Coll. Guard. vol. xxvii. p. 746.

A *résumé* from the 'American Manufacturer' of the original Report, which concerns itself chiefly with commercial details of the production of iron and coal in Ohio, but in which some information as to the composition and quality of both is to be found. G. A. L.

Wilkinson, Consul. Report on the Trade and Commerce of the Provinces of Malaga, Granada, Almeria, and Jaen for the year 1872. Reports from Her Majesty's Consuls; Commercial, No. 5 (1874), part 1. 8vo. Pp. 289–308.

Gives information concerning the mining districts, with analyses of the Robledal iron-ores.

Willcock, J. On the History, Progress, and Description of the Bowling Ironworks. Rep. Brit. Assoc. for 1873, Sections, pp. 219–222. (The paper has been printed in full by the Bowling Ironworks Company.)

The geology around Bowling and the character of the coal-seams and ironstone are described.

Windakiewicz, E. Das Erdöl und Erdwachs in Galizien. [Mineral oil and mineral wax in Galicia.] Berg- und hüttenmännisches Jahrbuch, Bd. xxiii. Heft 1.

Chiefly statistical.

Wooldridge, Vice-Consul. Report on the Trade and Commerce of Cayenne for the year 1872. Reports from Her Majesty's Consuls; Commercial, No. 5 (1874), part 1. 8vo. Pp. 64–81.

"Gold industry" described on pp. 75–77.

Worth, R. N. The Antiquity of Mining in the West of England. Trans. Plymouth Inst. vol. v. part 1, 1873–4, pp. 120–140, and Geol. Mag. dec. 2, vol. i. pp. 265–267.

Chiefly antiquarian. The writer thinks that the geological evidence would antedate the commencement of mining, and consequently the use of metals, to a time when the mammoth either still existed in the West of England or had not long disappeared, and when the general level of Devon and Cornwall was at least 30 feet higher than now. H. B. W.

Various reports from Her Majesty's Consuls in the United States on Peat Fuel. Commercial, No. 6 (1874). 8vo. Lond. Pp. 14.

Refers to the use of peat in Baltimore, Boston, Charleston, Mobile, New Orleans, New York, Philadelphia, and Portland.

Victoria. Mineral Statistics for the year 1873. No. 8. Melbourne.

PETROLOGY.

Achiardi, Antonio d'. Sulla conversione di una roccia argillosa in serpentino. [On the conversion of an argillaceous rock into serpentine.] Boll. R. Com. geol. Ital. pp. 366–369, woodcut.

Note on a section near Vignale, in the Province of Florence. An altered rock, traversed by veins of steatite and dolomite, contains nodules of serpentine coated with dolomite. These nodules may be traced gradually through all the stages of argillaceous rock into serpentine: the alumina replaced by magnesia has been separated as a white substance of the appearance of halloysite. E. B. T.

Allen, J. A. Metamorphic Products from the burning of Coal-Beds of the Lignitic Tertiary in Dakota and Montana. Amer. Journ. ser. 3, vol. viii. pp. 141, 142.

Abstract of paper in Proc. Boston Soc. Nat. Hist. vol. xvi. 1874.

Allport, S. On the Microscopic Structure and Composition of British Carboniferous Dolerites. Quart. Journ. Geol. Soc. vol. xxx. pp. 529–567 (2 plates).

The paper is based upon an examination of specimens from fifty-seven localities (Scotland, Ireland, Northumberland, and the Midland counties). As regards terminology, the author proposes to include all basic augitic rocks under the general name *Dolerite*, and to discontinue the use of such terms as Melaphyre, Aphanite, Anamesite, Diabase, and Greenstone. As regards the age of the rocks described, they are all supposed to be older than Permian. The minerals of which the Dolerite are composed are classed under the heads of *original* and *secondary* constituents: the latter (products of alteration) comprehend chlorite, calcite, and quartz; the former felspar, augite, magnetite, olivine, apatite, and mica. These minerals are each noticed, and then the Dolerites from the various localities are described. There are some masses of trap in the Carboniferous rocks of Scotland not yet examined. But all other basic rocks of the Carboniferous Series known to the author belong to the augitic group, with only two exceptions—the gabbro from Corstorphine Hill, Edinburgh, and the hornblendic trap of the Warwickshire Coal-fields. W. T.

——. Note on the Phonolite from the "Wolf Rock." Geol. Mag. dec. 2, vol. i. pp. 462, 463.

In examining microscopic sections of this rock the author finds that some of the crystals which he had taken for nepheline present the physical characters of nosean. This mineral had not been previously recognized in these islands. The "Wolf Rock" appears to be a typical phonolite, consisting of nepheline, nosean, sanidine, hornblende, and magnetite. F. W. R.

Anon. Ninth Annual Report on the Colonial Museum and Laboratory. New Zealand, 1874. Pp. 35.

The Laboratory Report contains 10 analyses of New-Zealand coals, 14 of limestones and other rocks, 7 of iron-ores, several assays of gold and antimony-ores, and an analysis of mineral water from the Province of Napier. F. W. R.

——. [On Andernach Trass.] Stoompost, 1874.

Trass is a tuffstone, found in the Eifel; the principal quarries are in or near the valley of the Brohl and the Nette, close to Andernach. The tuffstone is a volcanic ash, underlying pumice-stone; it contains from 50 to 60 per cent. of silica and only from 5 to 10 per cent. of lime. The silica is partly in a soluble state, forming with lime and water a silicate of great hardness. (From abstract in Proc. Inst. Civ. Eng. vol. xxxix. pp. 313–316.) W. T.

Baronowski, Joseph J. Die mineralogische und chemische Zusammensetzung der Granitporphyre. Zeitsch. deutsch. geol. Ges. Bd. xxvi. Heft 3, pp. 522–532.

Describes the mineralogical and chemical composition of granite-porphyry from near Leipzig and from Altenberg, in Saxony. The base consists of crystalline granules of quartz, felspar, hornblende, and chlorite, with magnetite and apatite. Its structure is therefore granitic, and thus essentially different from that of felsite-porphyry, in which the base is amorphous. The minerals forming the base separate out in distinct crystals. Sharply defined crystals of quartz have not been observed in any similar rock; if the quartz is crystallized, as in felsite-porphyry, the base is amorphous; if the base is crystalline, as in granite, the quartz occurs only in irregular angular granules. The felspar is partly orthoclase, partly plagioclase. Glass-cavities occur in both quartz and felspar; it is notable that they had not been previously observed in rocks with a crystalline base. Analyses are given of granite-porphyry from Beucha, near Leipzig, and from Altenberg. F. W. R.

Bertels, G. A. Ein neues vulkanisches Gestein. [New Volcanic Rock]. Verh. Würzburg. phys.-med. Ges. viii. pp. 32. [Noticed in N. Jahrb. Heft 8, pp. 873–875.]

A rock described by Sandberger as a nosean-andesite has been examined by Bertels, who regards it as a new species. A typical example of the rock occurs at the Sengelberg, near Salz. It is a felspar-and-hornblende rock, containing nosean and nepheline; but the felspar is purely triclinic. Chemical analyses of the rock are given. Bertels proposes to distinguish it as *Isenite*, from the River Eis (Isena). The hornblende becomes altered to a mineral which appears, from its analysis, to be a new species of the chlorite group, named by Bertels *phæactinite.* F. W. R.

Boricky, E. Petrographische Studien an den Phonolithgesteinen Böhmens. [Phonolites of Bohemia.] Arb. geol. Landesdurch.

Böhm. Bd. iii. Abth. 2, Heft 1, pp. 96, 2 chromolithographs. [Noticed in N. Jahrb. 1875, p. 320, and Amer. Journ. ser. 3, vol. vii. p. 518.]

Describes the microscopic structure and chemical composition of the Bohemian phonolites, and recognizes the eight following groups:—(A) *Nepheline-phonolites*: 1. Nepheline-phonolite; 2. Leucite-nepheline-phonolite. (B) *Nosean-phonolites* (Hauyne-phonolites): 3. Nepheline-nosean-phonolite; 4. Leucite-nosean-phonolite; 5. Sanidine-nosean-phonolite. (C) *Sanidine-phonolites*: 6. Nepheline-sanidine-phonolites; 7. Oligoclase-sanidine-phonolite, or Trachyphonolite; 8. Sanidine-phonolite. F. W. R.

Bradley, T. H. On Unakyte, an epidotic rock from the Unaka range, on the borders of Tennessee and North Carolina. Amer. Journ. ser. 3, vol. vii. pp. 519, 520.

The character relied upon for the separation of the species is the replacement of the *mica* of common granite, or the *hornblende* of syenite, by epidote. This rock is of Archæan age. G. A. L.

Corenwinder, B. Teneur en magnésie de la dolomie de Hure. [Amount of magnesia in the dolomite of Hure.] Ann. Soc. Géol. Nord, 1870–74, pp. 17, 18.

An analysis of dolomite from Hure (Boulonnais) gives 30 per cent. of carbonate of magnesia.

——. Analyse des dolomie de Hure, Saint-Remy-Chaussée, Pont-Sainte-Maxence, &c. [Analysis of dolomite from Hure, &c.] Ann. Soc. Géol. Nord, 1870–74, pp. 18, 19.

The dolomites are from the Carboniferous Limestone and the Calcaire grossier of Flanders, and from the Magnesian Limestone of Durham. Four analyses are given. G. A. L.

——. Présence de l'azote dans les parties calcaires de la tourbe d'Aveluy. [Presence of nitrogen in the calcareous portions of the peat of Aveluy.] Ann. Soc. Géol. Nord. 1870–74, p. 30.

Note of analysis. The origin of the nitrogen is supposed to be the decomposition of the plants of the peat.

——. Analyse de la tourbe d'Aveluy. [Analysis of the Aveluy peat.] Ann. Soc. Géol. Nord, 1870–74, p. 36.

Water 20·25, organic matter (combustible) 62·95, soluble salts 1·20, insoluble salt 15·60 per cent.

Credner, Georg R. Die krystallinischer Gemengtheile gewisser Schieferthone und Thone. [Crystalline constituents of certain shales and clays.] Zeitsch. gesammt. Naturwiss. N. S. Bd. x. pp. 19, with plate.

Zirkel has shown that Palæozoic clay-slates contain crystalline constituents. The author has extended these observations to shales and clays from the following formations:—Carboniferous, Permian, Trias, Jurassic, Cretaceous, Tertiary, and Drift. He recognizes three classes of constituents:—*Clastic* materials, or fine rolled fragments of minerals and rocks; *Crystalline* constituents, not developed by metamorphism, but deposited at the time of formation of the rock (some of these are figured); *Organic* constituents, chiefly remains of foraminifera. Concludes that although crystalline constitutents are not confined to the Palæozoic slates, the proportion of such constituents diminishes with the age of the rock; a Mesozoic shale, for example, contains less crystalline matter and more mechanically-formed materials than does a similar Palæozoic rock. F. W. R.

Cronquist, A. W. Jemförande undersökning af eldfasta leror från Stabbarps stenkolsschakt i Skåne. [Comparative analyses of fire-clays from the shaft of the Stabbarp Coal-mine in Scania.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 58–70, 1 fig. in text.

The analyses tend to show that the clays, which are Liassic, can be favourably compared with the best foreign fire-clays. A great number of analyses of various clays are given. G. A. L.

Curry, J. Stalagmitic Deposits. Geol. Mag. dec. 2, vol. i. p. 191.

Describes a deposit at Boltsburn, Durham, 18 inches long, 10 broad, and ¾ inch thick, which has been formed in fifteen years.

Dana, E. S. Abstract of a paper on the Trap Rocks of the Connecticut Valley. (Read to Amer. Assoc. 1874.) Amer. Journ. ser. 3, vol. viii. pp. 390–392.

This trap forms part of a system of dykes through the Secondary Sandstone of Nova Scotia, New Jersey, Pennsylvania, and North Carolina, but nowhere so well shown or in such numbers as in the Connecticut valley. The author finds that "the trap which has come up *through the older crystalline rocks* is most of all free from hydrous minerals or any evidence of alteration, its grains having a fresh, vitreous look on the fracture." A strongly amygdaloidal trap occurs in the same dykes as the massive variety. G. A. L.

Dana, J. D. [Connecticut Traps.] Zeitsch. deutsch. geol. Ges. Bd. xxvi. Heft 4, pp. 939, 940.

Letter stating that the writer's son had prepared about 150 sections of "trap" rocks from Connecticut, and had found them to consist of dolerite and diabase. The trap-dykes cutting through crystalline rocks are true dolerites, and the traps on the western border of the Connecticut valley are also free from chlorite, whilst those of the middle and eastern Triassic districts are diabase; the further to the east the richer are they in chlorite. F. W. R.

Dathe, J. F. E. Mikroskopische Untersuchungen über Diabase. [Microscopic Investigations on Diabase.] Zeitsch. deutsch. geol. Gessel. Bd. xxvi. Heft 1, p. 1.

Gives a list of the principal Saxon localities of diabase, a detailed description of the minerals which enter into its composition, and an account of the microscopic structure and relations of some of the typical Saxon diabases. The general conclusions are:—1. Diabases may be divided into two groups: *Diabase* composed of plagioclase, augite, titanic-iron, magnetite, pyrites, apatite; and *Quartz diabase*, a crystalline mixture of plagioclase, augite, quartz, magnesian mica, titanic iron, magnetite, pyrites, apatite. 2. The micro-structure of these groups is distinctly crystalline. 3. The eruptive origin of diabases is proved by their fluxed structure. 4. The plagioclase is always oligoclase. 5. The augite and magnesian mica are converted by alteration into viridite. 6. The magnetite is partly of secondary origin, and results from the alteration of augite and magnesian mica. 7. The alteration of the magnetite gives rise to hematite and limonite. 8. The pyrites is a subsequent product, also the limonite, and probably the specular iron ore. 9. The quartz is either a normal component or may be of secondary origin. 10. The calcspar is always of secondary origin. F. R.

Dawkins, W. B. Observation on the Rate at which Stalagmite is being accumulated in the Ingleborough Caves. Rep. Brit. Assoc. for 1873. Sections, p. 80. (See also Proc. Manchester Lit. and Phil. Soc. Feb. 1873.)

The observations go back to 1839 (those of that date having been made by Mr. J. Farrar), and they show that the boss of stalagmite known as the "Jockey Cap" is increasing at the rate of ·2946 of an inch per year. At this rate 20 feet of stalagmite might be formed in 1000 years. W. T.

Dewalque, G. Rapport sur une mémoire envoyé au concours de la classe des sciences de 1874, en réponse à la question suivante: *Faire connaître, notamment au point de vue de leur composition, les roches plutoniennes, ou considérées comme telles, de la Belgique et de l'Ardenne française.* [Composition of plutonic rocks of Belgium and the French Ardennes.] Bull. Ac. roy. Belg. 2 sér. t. xxxviii. no. 12.

The rocks described are quartzose diorite of Quenast and Lessines, gabbro (hypersthenite of Dumont) of Hozémont, porphyroids of Fanquez, Rebecq-Rognon, and Pitet, arkoses, quartzose porphyry of Spa, quartzose diorite of Lembecq, and rocks of the French Ardennes. The paper reported on is by Messrs. de la Vallée-Poussin and Renard, and will be published in the 'Mémoires Couronnés.' G. A. L.

Doelter, C. [Eruptive Rocks of Transylvania.] N. Jahrb. Heft 3, pp. 275, 276.

Gives a summary of the results of studies of these rocks, especially of the melaphyres and andesites; the former are Jurassic, the latter Tertiary. The andesites contain plagioclase, which in some cases is andesine, in others labradorite. F. W. R.

——. Die Trachyte des Siebenbürgischen Ezgebirges. [Trachytes of the Transylvanian Erzgebirge.] Min. Mitt. Heft 1, pp. 13–30.

Describes, in topographical order, a number of trachytic rocks from the Ore-mountains of Transylvania. The rocks are chiefly hornblende-andesites, of which two varieties are recognized—those containing quartz (*Dacite*), and those without it. Several analyses of felspars from these andesites are given. An augitic andesite is described from the Judenberg. F. W. R.

Doelter, C. Porphyrit von Lienz. Min. Mitt. Heft 1, pp. 89–91. [The title of this has been already printed at p. 57, from another journal, but without notice.]

This rock forms a vein in mica-schist in the Isel valley, and is believed to be not younger than the Rothliegende. A mineralogical description of the rock is given. It consists of plagioclase, with a little orthoclase, hornblende, and biotite. It may be classed with porphyrite; or, if separated as a distinct rock, may be called *palæoandesite*. F. W. R.

——. Ueber einige Trachyte des Tokaj-Eperieser Gebirges. Min. Mitt. Heft 3, pp. 199–222.

A continuation of studies on trachytes, describing the rocks of the mountains of Tokaj and Eperies. The following trachytic rocks occur in this range:—Augite-andesite, augite-andesite lava, hornblende-andesite, quartziferous augite-andesite, rhyolite, quartziferous sanidine-trachyte, and sanidine-trachyte lava. Descriptions of microscopic sections of these rocks and many chemical analyses are given. F. W. R.

——. Mikroscopische Untersuchung einiger Granite aus der technischen Sammlung der k.-k. geologischen Reichsanstalt. [Microscopic investigation of some granites in the collection of the Imperial Geological Institute.] Verh. k.-k. geol. Reichs. p. 147.

Dunn, E. J. Diamond-bearing Rock of S. Africa. See Addenda.

Egger, A. J. Amphibolfels von Felling. Min. Mitt. Heft 3, p. 243.

Analysis of a hornblende-rock from near Felling, in Austria.

Everwijn, R. Marmer op het eiland Amboina. Jaarb. Mijnw. Ned. O.-Ind. 3 Jaar., 1 Deel, pp. 172, 173.

Describes four specimens of marble from the island of Amboyna.

Fordham, H. G. Structure in Chalk. See p. 12.

Fouqué, F. Etude microscopique et analyse médiate d'une ponce du Vésuve. [Microscopic study and mean analysis of a Vesuvian pumice.] Compt. Rend. t. lxxix. pp. 869–872.

Galletly, John. Analysis of a Lepidodendroid Plant from the Shale of West Calder; with Remarks on the Formation of Coal. Trans. Edin. Geol. Soc. vol. ii. part 3, pp. 395–397.

Contains an analysis of the branch of a Lepidodendron.

Gardner, R., Jun. Protogine. Geol. Mag. dec. 2, vol. i. p. 432.

Referring to a notice that a fragment of protogine contains plant-remains, the writer asks if the rock in question may not be a sedimentary rock formed from protogine. W. T.

Genth, F. A. Investigation of Iron Ores and Limestones from Messrs. Lyon Short & Co.'s Iron-Ore Banks on Spruce Creek, Half-Moon Run and Warrior's Mark Run, in Centre, Blair and Huntingdon Counties, Pa. Proc. Amer. Phil. Soc. vol. xiv. no. 92, pp. 84–99.

Seems to be an interpolation in Prof. Lesley's paper (see p. 122). Consists of about 30 chemical analyses.

Gumælius, Otto. Om kalkgranit i Upland. [Calcareous granite in Upland.] Geol. fören. Stock. Förhandl. bdt. i. pp. 47, 48.

Note with table.

Gümbel, Dr. C. W. Die durch ein Eruptivgestein vercokte Kohle von Mährisch-Ostrau. [The coal of Mährisch-Ostrau, converted into coke by an eruptive rock.] Verh. k.-k. geol. Reichs. pp. 55, 56.

Describes the metamorphism of a bed of coal by an eruptive mass of augitic porphyry, which is itself greatly altered near the line of contact. H. A. N.

Guyerdet, —. Note sur quelques Roches du bassin de la Loire, recueillies principalement dans la partie comprise entre Roanne, Saint-Just-en-Chevalet et Boën. [On rocks of the basin of the Loire, from specimens gathered principally between Roanne, St. Just-en-Chevalet and Boën.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 497– .

The rocks described are:—greenish-brown Porphyritic Grit from Le More, near Cordelles, and green ditto from Lay; Pink quartziferous Porphyry from the banks of the Loire; Amygdaloid "Wacke" from La Tessone (analysis given); Reddish-brown felspathic Porphyry of Villemontais; Granitoid Porphyry of St. Just-en-Chevalet (analysis); Brown felspathic Porphyry of the same place; Pink quartziferous Porphyry from La Bombardi; Dioritine (green) of same place (analysis); Porphyroidal Eurite from same place (analysis); Granitoid Porphyry of Mt. Urfé; Porphyroidal Amphibolite of La Forge; Granitoid Porphyry of Boën-sur-Lignon (analysis); Red quartziferous Porphyry of Saint-Germain-Laval; Pink quartziferous Porphyry from La Prugne. G. A. L.

——. Sur la corrélation des phénomènes qui ont amené la transformation des sables éruptifs et de ceux qui ont produit la transformation de certains calcaires en dolomie dans les formations crétacées et tertiaires. [Correlation of the phenomena which have brought about the transformation of eruptive sands with those which have produced the alteration of certain limestones into dolomite in the Cretaceous and Tertiary formations.] Compt. Rend. 2 sess. Assoc. Française, pp. 438–443.

A chemico-petrological paper.

Hall, Townshend, M. Note on the Occurrence of Mineral Oil in Shale at Barnstaple. Trans. Devon. Assoc. vol. vi. part 2, p. 547.

The object of this note is to record the discovery of a vein, highly impregnated with mineral oil, traversing the Upper Devonian shale, which was exposed in digging the foundations for some new buildings at the lace-factory in the town. T. M. H.

Hayes, S. D. Lignite from Louisiana. Chem. News, vol. xxx. no. 774, pp. 153, 154 [from the 'American Chemist'].

An analysis of a lignite, of which considerable deposits occur on the banks of the Mississippi, about two miles below Shrevepoint. It has been proposed to use this lignite as fuel for steamboats. F. W. R.

Heidenhain, J. Chemisch-geologische Betrachtung der Gypsvorkommnisse in der Zechsteinformation. [Gypsum in Zechstein.] Zeitsch. deutsch. geol. Ges. Bd. xxvi. Heft 2, pp. 275–283.

Describes the occurrence of gypsum as a rock in the Zechstein of the Kyffhäuser in the Goldene Aue, S.E. Hartz. Recognizes two beds, and gives analyses of each; the lower contains less gypsum and more anhydrite than the upper. Refers the deposits to a marine origin, and suggests the formation of the gypsum by alteration of anhydrite. Sulphate of lime, if precipitated from solution under pressure of ten atmospheres, falls as anhydrite; and such a deposit might therefore be formed at sufficient depth in the sea. F. W. R.

Hilgard, E. W. Silt Analyses of Soils and Subsoils. Amer. Journ. ser. 3, vol. vii. pp. 9–17.

The State Geologist of Mississippi has given the results of his examination of the physical qualities of various cotton-soils. The observations were made with the "churn elutriator," described in a previous paper. With this the soils are divided into the following constituents, —coarse grit, fine grit, coarse sand, medium sand, fine sand, finest sand, dust, silt of six degrees of fineness, and clay; the percentages are given in tabular form. E. B. T.

Hilger, Prof. —. Ueber den oberfränkischen Eklogit. [Eclogite from Upper Franconia.] Sitzungsb. phys.-med. Soc. Erlangen, Heft 6, pp. 96–99.

Contains original analyses of specimens of Eclogite—one from Eppenreuth, another from Silberbach, and the third from the Falser Höhe, near Markt Schorgast. Separate analyses are given of the garnets and of the matrix of each of these rocks. F. W. R.

Hoernes, Rudolph. Vorlage von prismatischen Sandsteinen aus der Gegend von Reichenberg in Böhmen, durch Herrn J. Baumheyer. [Prismatic sandstones from the neighbourhood of Reichenberg, in Bohemia.] Verh. k.-k. geol. Reichs. pp. 401, 402.

How, Prof. H. On Two Coals from Cape Breton, their Cokes and

Ashes, with some comparative analyses. Journ. Chem. Soc. ser. 2, vol. xii. pp. 325–331.

Contains analyses of average samples of the whole thickness of the main-seam coal at the Sydney Mines, and of that of the Lingan Mine coal, as well as of the ashes of these coals. F. W. R.

HUDLESTON, W. H. Analyses of Gault, Ironstone, Phosphatic Nodule, and Marl, in paper by F. G. H. PRICE. See p. 31.

HULL, Prof. EDWARD. Microscopic Structure of Irish Granites. Journ. Roy. Geol. Soc. Ireland, ser. 2, vol. iv. pt. 1, pp. 4–8 (plate).

No. 2. *Granite of Allemore, Mayo.*—This forms an isolated mass, S. of Louisburg: it is fine-grained, greyish, and consists of quartz, orthoclase, triclinic felspar (? oligoclase), and dark green mica. In places it takes the appearance of graphic granite. It is surrounded by metamorphosed schistose beds, probably L. Silurian, and is older than the U. Llandovery Beds to the S. The *orthoclase* sometimes exhibits a cross-banded structure. The *oligoclase* (?) is not often crystalline. The *silica* is without crystalline form and highly cellular, containing fluid bubbles, sometimes of very irregular form. From the space they occupy it might be inferred that the original vapour was not highly rarefied. Tubes and trichites are rare. The mica shows a wavy structure, and sometimes encloses grains of magnetite, which are also found in the felspar. No. 3. *Granite of Ballyknockan, Co. Wicklow.*—This is considered the best building-stone near Dublin. The author quotes analyses, from which the presence of a soda-felspar had been inferred: this the microscope now reveals. The rock is finely crystalline-granular, and contains the following minerals—silica, orthoclase, triclinic felspar, grey mica, and mica of a fine bronze colour. The silica is amorphous and contains cells with fluid-bubbles, stone-cavities, trichites, tubes or tracks of gas-bubbles, and gas-cavities (?). The orthoclase is generally subcrystalline, and presents the cross-banded structure, while the triclinic felspar is considered to be albite. E. T. H.

——. On the Microscopic Structure of the Lambay Porphyry (or Porphyrite). Journ. Roy. Geol. Soc. Ireland, ser. 2, vol. iv. pt. 1, pp. 44–48, 3 woodcuts; and Geol. Mag. dec. 2, vol. i. pp. 449–453, 4 woodcuts.

The rock is a beautiful ornamental stone, resembling the green porphyry of Sparta and Marathon in appearance, but quite distinct in mineralogical composition. It has been intruded amongst the Silurian rocks before the Old-Red-Sandstone period. The normal rock consists of a dark green base, enclosing pale green crystals of orthoclase, up to an inch in length, with cavities containing segregations of chalcedony, epidote, chlorite, and calcite in vesicular cells. The rock has been considered hornblendic; but specimens fail under the microscope to reveal this mineral, and show that the dark colouring-matter of the base is due to the minute crystalline grains of magnetite with a little chlorite. Thus, although hornblende may occur as an accessory, the rock ought to be regarded as a felstone-porphyry, or "*porphyrite,*" not as a greenstone-porphyry. The author gives details as to the microscopic characteristics of each mineral. E. T. H.

Hull, Prof. E. On the Microscopic Structure of a Granitoid Quartz-porphyry from Galway. Monthly Mic. Journ. no. 61, pp. 11–13, with part of plate.

Describes the structure of a rock near Salt Hill, S. W. of Galway. It has the constituents of a granite; but the base is felspathic, not siliceous, and the rock is therefore a quartz-porphyry rather than a true granite. F. W. R.

——. Microscopic Structure of Basalt of Ballyleny. See p. 11.

——. Microscopical Notes. Memoir on sheets 76, 77, Geological Survey, Ireland. See p. 40.

Hunt, Dr. T. S. Remarks on Prof. Newberry's paper on "Circles of Deposition," &c. (p. 124). Proc. Amer. Assoc. vol. xxii. B, p. 196.

Reminds readers that twelve years ago he announced, on chemical grounds, that all magnesian limestones had been formed by the simultaneous precipitation of carbonate of lime and magnesia from solutions concentrated by evaporation. A. H. G.

——. La Chimie de la Terre. [The Chemistry of the Earth.] Rev. Univ. des Mines, t. xxxvi. pp. 246–295.

Translated from the Smithsonian Report for 1869. On the last page are some additional observations by the author. According to him, it is the decomposition of the crystalline rocks in ancient times which has been the source of all the clays of the non-crystalline rocks; and the alkalies set free during this decomposition have given rise, by their reaction on the waters of the ocean, to the carbonates of lime and magnesia of those rocks. In glaciated countries the crystalline rocks have suffered no decomposition since the glacial erosion; in non-glaciated countries these rocks are deeply decomposed. G. A. L.

Jannettaz, E. Note sur les minéraux et les roches recueillies dans l'Alaska et les Iles Aléoutiennes, par M. A. Pinart. [Minerals and rock-specimens from Alaska and the Aleutian Islands.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 122–125.

A descriptive catalogue of a small collection of minerals and rocks.

——. Les Roches. Description de leurs éléments: méthodo de détermination. Pp. viii, 285. 16mo. Paris (39 woodcuts).

John, K. Analyse eines Augit-Hornblende-Andesits von Toplitia bei György St. Miklos in Siebenbürgen. [Analysis of an augitic and hornblendic Andesite from Toplitia, near György St. Miklos, in Transylvania.] Verh. k.-k. geol. Reichs. pp. 120, 121.

Gives the physical, chemical, and microscopical characters of the Andesite.

John, K. Analyse eines Hornblende-Andesits von Tusnad am Büdös bei Kronstadt in Siebenbürgen. [Analysis of a hornblendic Andesite from Tusnad, on the Büdös, near Kronstadt, in Transylvania.] Verh. k.-k. geol. Reichs. pp. 242–244.

Points out that the rock, though regarded by Dr. G. Stache as a "Sanidine-oligoclase-trachyte," is really a hornblendic Andesite, as shown by analysis and microscopic investigation. H. A. N.

Judd, J. W. Scotch Volcanic Rocks. See p. 22.

Kalkowsky, Ernst. Die augithaltenden Felsitporphyre bei Leipzig. Zeitsch. deutsch. geol. Ges. Bd. xxvi. Heft 3, pp. 586–599.

Augitic felsite-porphyry occurs between Wurzen, Grimma, and Borsdorf, near Leipzig. The rock is composed of quartz, orthoclase, labradorite, augite, biotite, titanic iron-ore, magnetite, and apatite. . Each component is described in detail. The composition and colour of the porphyry vary; and the nature of the enclosures appears to vary with the composition: the more augite and plagioclase, the more glass-cavities; the more quartz and orthoclase, the more fluid-cavities. Composition of the rock varies geographically—the more basic varieties occurring in the east, the more acid in the west. The felsitic base is a fine-grained crystalline aggregate of quartz, two felspars, and augite. The base exhibits fluid structure. Concretions of dark and pale-coloured felsite occur in the porphyry. F. W. R.

——. Mikroskopische Untersuchungen von Felsiten und Pechsteinen Sachsens. [Felsites and pitchstones of Saxony.] Min. Mitt. Heft 1, pp. 31–58.

Describes microscopic structure of pitchstones, felsites, and felsite-porphyry from Saxony, with special reference to the character of the ground-mass. F. W. R.

Kenngott, A. N. Jahrb. Heft 5, pp. 515, 516.

Letter describing a concretion found loose near Brigels, in Switzerland. It consists of a crust of actinolite, enclosing a kernel of green granules and crystalline needles; the surface is coated with biotite. An attached fragment shows that the matrix was a fine-grained granite. F. W. R.

——. [Pitchstone and Obsidian.] N. Jahrb. Heft 6, pp. 608–611, 2 woodcuts.

Describes microscopic section of pitchstone from Garesbach, near Meissen. One of the disseminated crystals of orthoclase encloses a banded concretion. Elongated tube-like bodies, of irregular branching form, are also present in the pitchstone. The black obsidian from Hecla, previously described by the author, loses its colour on heating, but the enclosures undergo no change. It becomes vesicular when heated to near its fusing-point. F. W. R.

Knop, A. Ueber Kieselsäure-Abscheidungen und Oolithbildung. [Separation of Silica, and formation of Oolite.] N. Jahrb. Heft 3, pp. 281–288, woodcut.

Discusses the conditions under which silica can separate in the various forms of quartz, tridymite, asmanite, and opal. Describes a hornstone of oolitic structure occurring in the Trias of the Upper Rhine country. Reviews the hypotheses advanced to account for the formation of oolites in general, and records observations tending to show that they may occasionally be formed by incrustation of bubbles of gas liberated in calcareous waters, or by deposits in small shells. F. W. R.

Lasaulx, Dr. A. von. Ueber sogenannte Hemithrène und einige andere Gesteine aus dem Gneiss-Granitplateau des Département Puy-de-Dôme. [So-called Hemitrene &c. from Puy-de-Dôme.] N. Jahrb. Heft 3, pp. 230–260.

Concludes, from microscopic and chemical examination of typical examples of "Hemitrene," that this name should be abolished, as it is at present applied to several rocks essentially distinct, and having nothing in common except the presence of carbonate of lime. Also describes diorites, porphyries, and other rocks, from the plateau of gneiss and granite in the Dep. of the Puy-de-Dôme. F. W. R.

——. Sopra le rocce eruttive del Vicentino. [Eruptive rocks of the Vicenza district.] Boll. R. Com. geol. Ital. pp. 16–30.

An Italian translation of part of a paper in the Zeitsch. deutsch. geol. Gesell. Bd. xxv. (1873). Contains descriptions and analyses of various porphyrites, pitchstone-porphyry, trachytes, gabbro, &c. from the Vicenza district. E. B. T.

Lee, John E. Notes on Trappean Rock. Trans. Devon. Assoc. vol. vi. part 2, pp. 400–411. 4 plates.

This paper is illustrated by a series of 24 sketches, principally taken in Ireland, Scotland, France, Germany, and Italy, all relating to the structure of trap, basalt, and volcanic rocks. The author first describes the general peculiarities of basalt and trap, such as the varieties of the prismatic form, with the cross and cup sections of the prisms and their tendency to concentric weathering. In the second place is noticed the alteration caused by the intrusion of trap-dykes upon limestone, coal, sandstone, or whatever rock may be in proximity to them. The concluding part is a consideration of the effects which trap and volcanic action have upon scenery. T. M. H.

Leech, Prof. Notice of a Lightning-tube or Fulgurite found near Fayetteville, N. O. Proc. Ac. Nat. Sci. Philad. p. 145.

Lévy, Michel. Note sur quelques roches analogues aux porphyres granitoïdes de la Loire. Bull. Soc. Géol. France, 2 sér. t. ii. pp. 60–68.

A lithological description of specimens of granitoid porphyries from the Loire. The author divides them into three series—*felspathic*, *quartziferous*, and *euritic*, passing one into the other. G. A. L.

Lévy, Michel. Note sur une classe de roches éruptives intermédiaires entre les granites porphyroïdes et les porphyres granitoïdes. Groupe des Granulites. [A class of eruptive rocks between the porphyroid granites and the granitoid porphyries. Granulite group.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 177–189.

Proposes to restrict the name *Granulite* to rocks of an exclusively eruptive origin, fine-grained, essentially composed of abundant lamellæ of felspar (usually either orthoclase or oligoclase), in the midst of which are to be seen numerous grains of quartz and spangles of mica. To these *Granulites* are allied schistose rocks of the kind known in part as *Leptynite* by most authors, which will be called *Schistose Granulite*, and large-grained rocks known as *Pegmatites*. The ancient stratiform rocks allied to gneiss and mica-schist, which have been known under the above names, will all be grouped under the name *Leptynite*.
G. A. L.

——, and — Douvillé. Note sur les granulites et les porphyres quartzifères des environs d'Avallon (Yonne). [Quartzites and quartziferous porphyries of Avallon (Yonne).] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 189–195.

A detailed lithological description of the granulites and granitoid rocks between Lormes and Avallon. The various rock-types distinguished by the author are :—

Porphyroid Granite	Coarse-grained type.
Granite with white mica (Granulite)	
Granitoid Porphyry of St. Just	
" " of Boën	Very fine-grained granulites.
Granulitic *Elvans*	True porphyritic type, merging into the very quartziferous type.
Granitoid Porphyries of Urphé	
Porphyries with Pinite of Auvergne	

The chronological order of the rocks gives the following series :— 1. Porphyroid granite. 2. Granulite (Devonian). 3. Granitoid porphyry (Carb. limestone) and Porphyry with Pinite of Auvergne.
G. A. L.

Lindström, Axel. Om kalkhalten i mergel. [Percentage of lime in marl.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 33–44.

The results obtained and the opinions held with regard to this subject by various writers, from Pliny onwards, are quoted.

Lossen, K. A. Der Bode-Gang im Hartz, eine Granit-Apophyse von vorwiegend porphyrischer Ausbildung. [The Bode dyke in the Hartz.] Zeitsch. deutsch. geol. Ges. Bd. xxvi. Heft 4, pp. 856–906.

Suggests that a hot fluid granitic magma was injected into a fissure extending from the Ramberg granite towards the Brocken, and that, by rapid cooling, the rock in the vein assumed a porphyritic structure. The crystalline texture of the granite is lost; the further the vein is from the main mass the more decided is the porphyritic structure. The texture of the vein is more compact towards the walls. A description of microscopic structure of the "salband" is given.

F. W. R.

Malaise, C. Sur quelques roches porphyriques de Belgique. [Porphyritic rocks of Belgium.] Bull. Ac. roy. Belg. 2 sér. t. xxxviii. no. 7, pp. 70–87.

The porphyritic rocks of Belgium, which are looked upon as plutonic or metamorphic, are found in the Stavelot hills and in those of Brabant and Sambre-et-Meuse. One eurite alone has been observed in the Lower Devonian, at Piroy (Malonne). With the exception of the last case, these rocks, although later than the Cambro-Silurian series, are pre-Devonian. The author brings together in this paper all the observations of previous writers, besides his own, regarding these rocks. He divides them into simple and compound felspathic rocks, eurite alone belonging to the former group, whereas the latter comprises hypersthenite, chlorophyre, diorite, and the schistoid porphyries, which themselves comprise the schistoid porphyry, the *albite phylladifère*, and the *eurite phylladifère* of Dumont.

G. A. L.

——. Rapport sur un mémoire en réponse à la question: Faire connaître, notamment au point de vue de leur composition, les roches plutoniennes, ou considérées comme telles, de la Belgique et de l'Ardenne française." [Report on a paper on the plutonic rocks, or those regarded as such, of Belgium and of French Ardenne.] Bull. Ac. Roy. Belg. 2 sér. t. xxxviii. no. 12, pp. 775–784.

The report proper is prefaced by a short *résumé* of the rocks which, in the author's opinion, should form the subject of study, in order that the question asked may be properly answered. This introduction forms a summary of Dumont's views respecting the plutonic rocks of Belgium and the adjoining part of France.

G. A. L.

Malet, H. P. What is Basalt? Science Gossip, no. 114.

Note on the occurrence of apatite and olivine in basalt, as proof that the rock is not igneous.

Maskelyne, Prof. N. S., and Dr. W. Flight. On the Character of the Diamantiferous Rock of South Africa. Quart. Journ. Geol. Soc. vol. xxx. pp. 406–416, woodcut.

The diamonds occur in an altered igneous rock, apparently a bronzite-rock, converted, for the most part, into a hydrated magnesium silicate. The soft ground-mass of the rock contains included fragments of shale and a new mineral of the vermiculite group, described as *Vaalite*. It also contains a green ferriferous enstatite (bronzite), a paler-coloured bronzite, a hornblendic mineral resembling smaragdite, garnets, ilmenite, and, in some cases, an altered diallage. Opaline silica and calcite are often present as minerals of secondary origin. The altered rock is traversed by veins of diorite; and the diamonds appear to be most abundant in the neighbourhood of these veins. The paper contains analyses of the principal rock-constituents, and descriptions of specimens from Bulfontein, Du Toit's Pan, and the New Rush.

F. W. R.

Meunier, Stan. Présence de la zircosyénite aux îles Canaries. [Zircosyenite from the Canary Islands.] Compt. Rend. t. lxxix. pp. 594, 595.

Notices the presence of zircosyenites, identical with those of Scandinavia, at Fortaventure, in the Canary Islands.

Möhl, H. Die Basalte der rauhen Alb, mikroskopisch untersucht und beschrieben. Jahresheft Ver. Naturk. Württemberg, p. 33, with plate. [Noticed in N. Jahrb. Heft 7, pp. 745–747.]

Description of microscopic structure of the basalts of the Swabian Alb. All of them are nepheline-basalts. The olivine is remarkably fresh even in rocks which have been much altered; some of the basalts are rich in apatite; in others the nepheline and vitreous base are converted into carbonate of magnesia and a zeolite, regarded as chabasite.

F. W. R.

——. Mikromineralogische Mittheilungen. Erste Fortsetzung. N. Jahrb. Heft 7, pp. 675–710, Heft 8, pp. 785–804, with plate.

Describes microscopic structure of several newly discovered German haüyne-basalts; trachyte-pitchstone, quartz-trachyte lava, and sanidine-trachyte lava from East Java; sanidine-trachytes from Flores and Aden; trachytes from Central Java; diabase from Borneo; bronzite from Borneo; and minette from Saxony. Also describes sandstone and limestone altered by basalt, from Weissholz, near Lütgeneder.

F. W. R.

——. Ueber die mineralogische Constitution und Eintheilung der Phonolithe. N. Jahrb. Heft i. pp. 38–45.

The results of the study of 624 microscopic sections of phonolite. Describes the mineralogical constitution of typical sections, and suggests the following classification—Nosean-phonolite (2 varieties), Haüyne-phonolite (2 varieties), Nepheline-phonolite, Nepheline-glass phonolite, and Mica-phonolite. F. W. R.

——. Zusammenstellung, mikroskopische Untersuchung und Beschreibung einer Sammlung typischer Basalte. [Microscopic structure &c. of Basalts.] N. Jahrb. Heft 9, pp. 897–942, with plate.

A descriptive catalogue of a collection of 30 specimens of typical basalts, selected by the author and prepared as microscopic objects by Fuess of Berlin. Two groups are recognized—vitreous basalts and true basalts: the latter class is subdivided into 6 groups—magma-basalts, felspar-basalts, nepheline-basalts, leucite-basalts, haüyne-basalts, and mica-basalts. F. W. R.

Nedeljkovic, S. Syrmier Sanidin-Trachyt. Verh. k.-k. geol. Reichs. pp. 15, 16.

Describes the occurrence of an area of sanidine-trachyte in the "Fruska Gora" mountains, south of Peterwardein in the Banat, on the northern bank of the Danube. The trachyte holds large crystals of hornblende and glassy felspar (sanidine), and is stated to be Post-Cretaceous. H. A. N.

Noguès, A. F. Lignites and Peats. Coll. Guard. vol. xxviii. p. 900.

Article translated from "La minéralogie et la minéralurgie à l'Exposition Universelle de 1867." Analyses of lignites and peats are given, with the characteristics of the French and Swiss lignites and of the French, Dutch, and Italian peats. G. A. L.

Ortlieb, J. Composition chimique et minéralogique d'un banc de calcaire silicifié du dévonien de Hergies-les-Bavai. [Chemical and mineralogical composition of silicified limestone from the Devonian of Hergies-les-Bavai.] Ann. Soc. Géol. Nord, 1870–74, pp. 37, 38.

Analysis given—91·27 per cent. of carbonate of lime, 6·92 of insoluble and 0·42 of soluble silica.

Pettersen, K. Om Gabbroen paa Seiland, Vest-Finmarken. [Gabbro from Seiland, Western Finmark.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 125, 126.

Pichler, A. [Rock from Innsbruck.] N. Jahrb. Heft ix. p. 961.

A letter containing reference to a peculiar variety of micaceous clay-slate or phyllite from Innsbruck.

Roth, Herr. Ueber die Obsidian- und Perlitströme des Guamani in Ecuador. Monatsb. k. preuss. Ak. Wiss. pp. 378–385.

Describes specimens of obsidian and perlite from the neighbourhood of the Filo de los Corrales, about 4300 metres above the sea-level, and from the Tablon de Ytulgache, 3361 metres high, both localities being in the Guamani mountains of Ecuador. F. W. R.

Rudler, F. W. Basalt. Science Gossip, no. 117, p. 212.

Note in reply to Mr. Malet. Argues that the presence of apatite and olivine in basalt cannot be regarded as evidence against the igneous origin of this rock. F. W. R.

Rumpf, J. Gosau-Kohle von der Kainach. Min. Mitt. Heft 2, p. 178.

Analysis of coal from sandstones of the Gosau beds from the Kainach.

Rutot, A. Note sur quelques échantillons d'anthracite provenant de La Mure, département de l'Isère (France). [Samples of anthracite from La Mure (Isère).] Ann. Soc. Géol. Belg. t. i. 1874, Bull. pp. xxxviii–xl.

Short description giving chief characters of the coal.

Scheurer-Kestner, Aug., and Ch. **Meunier-Dolfus**. Etudes sur trois combustibles du Bassin du Donetz et sur un lignite de Toula (Russie). [Three combustible minerals of the Donetz, and lignite of Toula, Russia.] Ann. Chim. Phys. sér. 5, t. ii. pp. 325–332.

Schlœsing, Th. Sur la constitution des Argiles. [Composition of clays.] Compt. Rend. t. lxxviii. pp. 1438–1442, and t. lxxix. pp. 376–380, 473.

Describes experimental methods of distinguishing between clays which are crystalline in structure and amorphous or *colloid* clays. The second note chiefly consists of an explanation of the author's application of his mode of clay-analysis to kaolins. A number of analyses are given. G. A. L.

Schmidt, Dr. C. Die 'Mineralbutter' der Uferfelsen der Irtisch und Jenissei. [Mineral butter from Siberia.] Mél. Phys. Chim. t. ix. pp. 5–9. [Bull. t. xix. pp. 63–66.]

Gives analyses of "stone-butter" from the Jenissei and of "mountain-butter" from the Irtisch. Both contain basic sulphates of alumina and peroxide of iron, with sulphates of magnesia, lime, potash, and soda; but that from the Jenissei contains also sulphate of ammonia, and is richer in sulphate of magnesia than the other. F. W. R.

Senft, Dr. Analytische Tabellen zur Bestimmung der Classen, Ordnungen, Gruppen, Sippen und Arten der Mineralien und Gebirgsarten. Hanover. Pp. 102.

The second part contains tables for the determination of species of rocks.

Stolba, F. [Dolomitic Sandstones from the Silurian Formations.] Chem. Centr. p. 134. [Noticed in Journ. Chem. Soc. ser. 2, vol. xii. p. 967.]

Contains analyses of these rocks.

Stolpe, M. Fosfosyrehaltig bergart i Skåne. [Rock containing phosphoric acid in Scania.] Geol. fören. Stockholm Förhandl. bdt. i. p. 235.

Note of occurrence.

Stur, D. Phosphorsäurehaltige Gesteine in einem Bohrloche bei Schönau in Böhmen. [Rocks containing phosphoric acid in a boring near Schönau, in Bohemia.] Verh. k.-k. geol. Reichs. pp. 399, 400.

Taylor, **Andrew**. Chemical notes of Analyses of various Coals and Peat-fuels. Trans. Edin. Geol. Soc. vol. ii. part 3, pp. 371–373.

T. [**Tschermak**?]. Stalagmit aus der Adelsberger Grotte. Min. Mitt. Heft 2, pp. 179, 180.

Describes a group of stalagmites from the Erzherzog-Johann grotto at Adelsberg, exhibited at the Vienna Exhibition, and afterwards presented to the Imperial Museum. F. W. R.

Ulrich, G. H. F. A Descriptive Catalogue of 577 Specimens of Rocks in the Industrial and Technological Museum, collected from all parts of Victoria. With Explanatory Notes on their Character, mode of Occurrence, and Geological Relations. Report of the Trustees of the Public Library, Museums, and National Gallery of Victoria, for the year 1873–74, pp. 36–66. Melbourne.

A classified catalogue, with geological notes on the specimens. Tables showing the chemical analysis of many of the specimens are given.

Vlaanderen, Dr. C. L. Eetbare aarde van de Humbolts-baai, Nieuw-Guinea. Jaarb. Mijn. Ned. O.-Ind. Jaarg. 3, Deel 1, p. 179.

A sample of edible earth from Humboldt's Bay, New Guinea, was soluble in hydrochloric acid, with the exception of about 1·5 per cent. The principal constituents of the earth were soluble silica, magnesia, oxides of iron, and water. F. W. R.

Vogelsang, Hermann. Die Krystalliten. [Published after the death of the author by **Ferdinand Zirkel.**] Pp. 173, 16 plates. 8vo. Bonn 1875 (1874).

Treats of the phenomena observed in the separation of crystallizable substances from viscid media capable of opposing sufficient resistance to the aggregation of the unit particles at the moment of solidification to prevent the formation of definite crystals. The author first treats of the aggregations of globules, linear and radiated aggregates, observed when sulphur dissolved in bisulphide of carbon is prevented from crystallizing by the addition of Canada balsam to the solution, and describes the different results obtained by microscopic observation, according as the crystallizing power of the sulphur or the resistance of the solvent medium prevails. The information so obtained is applied to the study of the imperfectly-crystallized silicates found in vitreous blast-furnace slags, in natural silicated rocks, the structure of the base of porphyritic rocks, the flower structure in ice, and the structure of precipitated carbonate of lime. The latter series of investigation is necessarily incomplete, owing to the death of the author. It is noticeable that he inclined to the belief that the so-called eozoonal structure and the coccoliths of chalk may be perfectly paralleled in precipitated carbonate of lime formed by the action of carbonate of ammonia upon chloride of calcium. The illustrations comprise careful drawings of the numerous appearances described; and several are coloured. H. B.

Vogt, Carl. Sur la structure microscopique des roches volcaniques. [Microscopical structure of volcanic rocks.] Compt. Rend. 2 sess. Assoc. Franc. pp. 362, 363.

The writer combats Stoppani's view that the vitreous mass in lavas is formed only at the surface of lava-currents and by secondary fusion at the expense of a mass composed exclusively of crystals; the two elements, he says, exist together in lava. He likewise denies the truth of Vogelsang's interpretation of "*fluidal* structure," which he says is to be found not only in certain lavas but also in the siliceous deposits of the Icelandic geysers. This structure is due, according to him, to the ductile nature of silicates, which makes them remain a long time in a semifluid state before solidifying. G. A. L.

Vrba, Dr. Karl. Beiträge zur Kenntniss der Gesteine Süd-Grönlands. [Contributions to knowledge of the rocks of S. Greenland.] Sitzungsb. k. Ak. Wiss. math.-nat. Cl. Abth. i. Bd. 69, pp. 61–122, with 2 chromo-lithographs and 1 plain plate.

The rocks examined are gneiss from island Illuidlek; plagioclase is the predominant felspar, but orthoclase is present; the quartz contains needles of apatite, mica, and cavities with liquid. The granites are mostly coarse-grained; analyses of some are given; a syenitic granite containing arfvedsonite &c. is described. Eudialite-syenite from Kittisut Island contains elæolite, hornblende, felspar (plagioclase chiefly), but no zircon. Orthoclase-porphyry occurs as dykes in granite &c. having a glassy paste. Diorites are found both on the E. and W. side of S. Greenland; plagioclase and orthoclase are always present, hornblende &c.; some are quartz-bearing. In one case the felspar crystallized after the hornblende. Diabase seems restricted to a few localities. Labradorite, the prevailing felspar, shows polysynthetic macles, and contains fluid-cavities, apatite-needles, &c. Gabbro, an eruptive rock consisting of plagioclase, diallage, and mica, occurs at the entrance of the Lichtenau fjord. E. B. T.

Westphal, Major. Beschreibung eines Porphyrganges mit losen Orthoklaskrystallen im Elbthalgebirge. [Porphyry-dyke with crystals of orthoclase.] N. Jahrb. Heft 1, pp. 33–37.

A vein of quartz-porphyry, partly decomposed and with many crystals of orthoclase, occurs on the left bank of the Elbe near Niederwartha.

Wurtz, H. Outline report on ‘Greenland Coal,’ or Lignite, brought from the mines at Disco Island by the U.S. steamer ‘Juniata,’ in 1873. Proc. Lyc. Nat. Hist. N. York, ser. 2, pp. 119, 120.

Original full report in ‘American Chemist,’ vol. iv. p. 401.

Yardley, H. B. Analysis of Jerusalem Coprolites. Chem. News, xxix. no. 761, p. 280.

A sample of ground coprolite, said to have been sent from Jerusalem, contains 11·05 p. c. of phosphoric acid. Complete analysis given.

See also the following :—

Anon. Analysis of rocks, Belfast: p. 1.
Barnett, A. K. Elvans, Cornwall: p. 2.
Cox, E. T. Analyses of limestones &c., Indiana: p. 113.
Duvillier, —. Analysis of clay, Boulonnais: 48.
Hartt, C. F. Analysis of limestone, Tapajos: p. 118.
Jones, Prof. T. R. Description of specimens from Griqualand West, in Stow's paper: p. 147.
Schmidt, A., R. Chauvenet, &c. Analyses of rocks, Missouri. See Broadhead, p. 111.

METEORITES.

[This section is chiefly from the pen of Dr. Flight. Details may be seen in his 'History of Meteorites,' 1869–1875, now publishing in the Geological Magazine.]

Apjohn, R. On the Analysis of a Meteoric Stone, and the detection of Vanadium in it. Journ. Chem. Soc. ser. 2, vol. xii. p. 104.

The Adare Meteorite (Sept. 10, 1813) has the following composition:—nickel-iron 19·07, magnetic pyrites 6·54, chromite 1·75, soluble silicate 35·44, and insoluble silicate 37·07; total 99·87. The metallic portion contains 14·275 per cent. of nickel and 0·602 per cent. of cobalt. This meteorite is the first in which the presence of vanadium has been detected: the amount present was not determined; but the author thinks that it is about half that in certain trap-rocks of Ireland and Italy, and that it occurs as an oxide associated with the chromite. The analyses show the presence of a larger proportion of manganese oxide than has been met with in any other meteorite. W. F.

Burkhart, Dr. Die Meteoreisenmasse von dem Berge Descubridora bei Poblazon unweit Catorze im Staate San Louis Potosi der Republik Mexico. [Meteoric Iron from Mexico.] N. Jahrb. Heft 1, pp. 22–28, with plate.

The last paper by the late Dr. Burkhart on the above subject gives the history of the meteoric iron of Descubridora, Poblazon, near Catorze, State of San Louis Potosi, which was found between 1780 and 1783. He gives three drawings of this mass, which weighs 575 kilog. It is a very malleable iron; and many implements have been manufactured from it. When etched it develops very complete figures; the angle 109°, corresponding to that of the octahedron, is frequently noticed. It encloses rounded masses of troilite, has the specific gravity 7·38, and the following composition:—iron 89·51, nickel 8·05, cobalt 1·94, sulphur 0·45; chromium and phosphorus, traces: total 99·95. W. F.

Daubrée, G. A. Note sur une météorite tombée le 20 Mai, 1874, en Turquie, à Virba près Vidin. [Meteorite at Virba.] Compt. Rend. t. lxxix. pp. 276, 277.

This meteorite has a dull black crust; a fractured surface has a light grey colour and finely grained texture, with grains of metal distributed throughout the mass. In parts spherular structure is apparent; the colourless particles act on polarized light. The presence of nickel-iron, an iron sulphide, chromite, olivine, and an ingredient which forms less than half of the stone, and is believed to be enstatite, was recognized. The stone is a member of a large class of meteorites, of which the Sucé meteorite (Sept. 13, 1768) may be considered a type. W. F.

——. Note additionnelle sur la chute de météorites qui a eu lieu le 23 Juillet 1872, dans le Canton de St.-Amand (Loir-et-Cher).

[Additional note on the fall of meteorites in St. Amand.] Compt. Rend. t. lxxix. pp. 277, 278.

Announces the discovery of 4 more stones belonging to this fall, making 6 in all.

Daubrée, G. A. Observations relatives à la Météorite de Roda. Compt. Rend. t. lxxix. pp. 1509–1511.

Noticed at p. 218 with the paper by **Pisani**.

Geinitz, H. B., and E. Geinitz. Ueber ein neues meteoreisen. Sitzungsb. Isis, Dresden, pp. 5, 6.

Meteoric iron of Eisenberg, Saxe-Allesburg, Germany (1873 ?). A block of metal, weighing 1·579 kilog., was found at the foot of the Schneckenberg, north of Eisenberg. It contains 97·27 per cent. of iron, but neither nickel nor cobalt. W. F.

Gibbons, —. Note on the Cranbourne Meteorite. Trans. Roy. Soc. Vict. x. pp. 130, 131.

Goebel, Mag. Ad. Bericht über einen neuen Eisenmeteoriten vom Ufer der Angora aus dem Gouv. Jenisseisk. [New meteoric iron from Siberia.] Mél. Phys. Chim. t. ix. pp. 95–109, two woodcuts of the meteorite. (From Bull. t. xix. pp. 544–554.)

Describes a mass of meteoric iron found in 1873 near the river Angorà, in the Government of Jenisseisk. It weighs 12 pud (= 433 lbs.), and contains:—iron, with traces of calcium, cobalt, carbon, and insoluble crystalline residue, 92·6346, nickel 7·1038, magnesium 0·0565, silicon 0·0421, phosphorus 0·1630, = 100. F. W. R.

——. Ueber die neuerdings gegen den kosmischen Ursprung des Pallas-Eisen erhobenen Zweifel, nebst einer Widerlegung derselben. [Cosmic origin of the Pallas iron.] Mél. Phys. Chim. t. ix. pp. 131–174. (From Bull. t. xx. pp. 100–130.)

A critical examination of the objections recently urged against the meteoric origin of the iron found in Siberia by Pallas. The St. Petersburg Academy caused the locality in which it was found to be explored in 1873 by Herr Lopatin, whose preliminary report is here published. F. W. R.

Luanco, Josi R. Descripcion y analisis de los aerolitos que cayeron en Cangas de Onis (Asturias) en 6 de Diciembre de 1866. An. Soc. Españ. Hist. Nat. vol. iii. part 1.

Analyzes and describes the aerolites which fell at Cangas de Onis, in Asturias, Dec. 6, 1866. One of these weighs 11 kilograms; and, according to analysis, their composition is 38·8 per cent. iron, 34·4 silica, 9·6 magnesia, 2·5 lime, 2 sulphur, 1·9 alumina, 1·1 soda, 1 nickel, besides less amounts of potash, phosphorus, chlorine, ammonia, manganese, and organic matter. J. M'P.

Medlicott, H. B. Record of the Khairpūr meteorite of 23rd Sept. 1873. Journ. As. Soc. Beng. pt. ii. no. 2, pp. 33–38.

This meteorite fell in several pieces near Multan, Punjab. These stones, of which 30 lbs. weight have been found, have the usual steel-grey colour, and exhibit compact crypto-crystalline structure. One specimen has the specific gravity 3·66. W. F.

Nordenskiöld, A. E. Ueber kosmischen Staub der mit atmosphärischen Niederschlägen auf die Erdoberfläche herabfällt. [Cosmical Dust.] Pogg. Ann., Bd. cli. pp. 154–165; also Journ. prak. Chem. Bd. ix. pp. 356–367.

Concludes, from an examination of snow from several localities, that small quantities of cosmical dust are brought to the surface of the earth by atmospheric precipitates. This dust contains metallic iron, cobalt, nickel, phosphoric acid, and organic matter. Compares dust collected from snow on Spitzbergen with that found on the surface of ice in Greenland, and called *Cryoconite*. Description and analyses of cryoconite are given. [See also p. 109.] F. W. R.

Pierson, W. M. See Addenda.

Pisani, F. Analyse d'une Météorite tombée dans la province de Huesca en Espagne. Compt. Rend. t. lxxix. pp. 1507–1509.

This stone (1871) was probably about the size of a fist; it was covered with a black crust, and has an ashy grey interior, in which greenish grains of peridot, some several millimetres in diameter, can be distinguished. Only 17·45 per cent. of the meteorite is broken up by acid. The soluble part appears to be an olivine with a little anorthite; that which is insoluble, a bronzite according to Daubrée; Pisani, on the other hand, considers it to be hypersthene. The ratio of the iron oxide to magnesia is the same as that of the bronzites of Hainholz, Shalka, Burkart, and other meteorites. One well-marked cleavage of this mineral was noticed, as well as a second less perfectly developed. The angle of the optic axis, measured in oil, makes $2H = 104°$. The bisectrix is negative; but whether it is the acute or obtuse bisectrix was not determined. Daubrée founds his belief that the chief constituent of the Roda stone is bronzite on the absence of dichroism, the frequence of the right angle in the contour of the crystals, and the fineness of the striæ. This meteorite, with the single exception that it contains no iron, bears a close resemblance to the Ledran stone (1868, October 1), and establishes a link between cosmical rocks and those of our planet. W. F.

Sipöcz, L. Meteorit von Orvinio. Min. Mitt. Heft 3, pp. 244–246. Analyses of meteorites from Orvinio, near Rome.

Smith, J. Lawrence. On a mass of Meteoric Iron of Howard Co., Indiana; with some remarks on the molecular structure of meteoric Iron, and a notice concerning the presence of solid protochloride of iron in meteorites. Amer. Journ. ser. 3, vol. vii. pp. 391–395.

A meteoric iron weighing 4 kilograms was dug up by a farmer in 1862, but lost sight of for some years. It contained iron 87 per cent., and nickel 12·3; etched with acid it showed no figures. It is suggested that the absence of figures is due to rapid cooling, that under slow cooling the phosphides of nickel and iron show a tendency to separate in certain parts representing the spaces between the crystals of the mass, but that under slow cooling we may expect such a diffusion of the phosphorus as would give no marked indications in any parts of the mass. Notice is then made of the occurrence of protochloride of iron as a green mass in the meteoric iron from Rockingham Co., N. Carolina (1871). E. B. T.

TSCHERMAK, G. Der Meteoritenfund bei Ovifak in Grönland. Min. Mitt. Heft 3, pp. 165–174.

Tshermak has examined two microscopic sections of the rocks accompanying the meteoric iron of Ovifak (1870), comparing them with others cut from the meteorites of Jousaç, Jurinas, Petersburg, and Stannern; the latter chiefly consist of augite and anorthite, with little or no nickel-iron, and form the class to which G. Rose gave the name of "eucritic." Both the sections have such a crust as meteorites possess; but it is so altered by oxidation that it is not possible to determine whether it is the fused crust usually noticed on a meteorite. The crystals of felspar (anorthite) are fully developed; they penetrate, and must have been formed, before the augite, iron, and magnetite. They are transparent, and have few and large cavities filled partly with black granules, partly with a brown substance, and some with a transparent glassy substance. The augite is light greenish brown; it fills gaps between the other constituents, as in dolerites and diabases, and encloses black grains. In the section containing iron the colourless felspar encloses a black or brown substance, or dust-like fine black granules, or larger round transparent bodies of a violet colour. Side by side with the felspar, brown grains, probably augite, are seen. Black particles also occur semimetallic by reflected light, and probably magnetite, as well as others likewise black, but lustreless (? graphite). A few small grains of troilite were also recognized. In the second section the felspar-crystals were larger, the matrix being made up of finer crystals; and in some were cloudy pale-brown patches, due to numberless minute elongated enclosed granules in parallel positions, or to others shorter and more rounded. These appearances recall those noticed in eucritic meteorites, except for the fact that these enclosed particles are smaller. The larger cavities in the felspar are filled in the same manner as in the other section. The structure of eucritic meteorites is tufaceous; that of the Ovifak rock very compact. This distinction, however, has often been observed in meteorites. Many chondritic meteorites are tufaceous, while others, having similar chemical composition, are compact and crystalline. The augite of the Ovifak rocks has not the characteristic filled cavities observed in that of certain eucritic meteorites; but in the augite of some meteorites they are equally wanting. The meteorites of Ovifak in some respects resemble the carbonaceous meteorites, though they differ from them in others, especially in the appearance of both metallic and rocky portions. They form a new type of meteoric rocks, and fill the gap that has separated the carbonaceous from other meteorites. W. F.

Tschermak, G. [The Meteorites of Orivinio, Rome (1872, Aug. 31)]. Sitzungsb. k. Ak. Wiss. lxx.

Devoted to an inquiry into the structure of this stone. It is made up of light-coloured fragments, surrounded with a dark-coloured cementing material. The former are normal chondrite, have a yellowish grey colour, and enclose spherules and particles of nickel-iron and magnetic pyrites. The latter contains numerous particles of the two last-mentioned ingredients, for the most part uniformly distributed; the portion nearest the fragments bears distinct indications of having been fluid, and conveys the impression that this cementing material was in a plastic condition while in motion. The Orivinio stone resembles certain brecciated volcanic rocks, which consist of a groundmass through which granular fragments of the same rock are distributed, as when older crystalline lavas are interpenetrated by others more compact and more recent. The light-coloured fragments are chondritic; and among their constituents are olivine, bronzite, and a finely foliated mineral, which may be a felspar. The darker material which coats these fragments and fills the finer flaws between them contains two ingredients—an opaque semivitreous constituent and particles in every way similar to the dark crust of the fragments from which they may have been detached; many of them can still be recognized as olivine and bronzite. The paper is illustrated with drawings of microscopic sections of the two rock-varieties. W. F.

——. [The Chantonnay Meteorite (1812, Aug. 5)]. Sitzungsb. k. Ak. Wiss.

Detects the presence of olivine, bronzite, a finely fibrous translucent mineral, nickel-iron, and magnetic pyrites, and finds that it bears a great resemblance to the meteorite of Orivinio, but contains less iron. The structure is chondritic; but there are not many spherules. From an investigation of the black veins, the author thinks that this meteorite, at the time of its formation, was brought into contact with molten material. Although Von Reichenbach held that these veins were intimately connected with the fused crust of the meteorite, it must not be forgotten that meteorites in their interior have a low temperature when they reach the earth; and an examination of this stone indicates that its fused crust has only penetrated the body of the stone to the depth of 6 mm., the clefts in some cases remaining partly open. He points out that the Chantonnay meteorite has a composition differing in no material degree from that of the Orivinio meteorite, the chondritic fragments and the dark-coloured cementing material of which were found to have the same composition. The structure of the stone closely resembles that of a metamorphosed breccia. He considers that the Chantonnay and Orivinio stones indicate changes that have occurred on the surface of some planet, which has subsequently been shattered into fragments. W. F.

MINERALOGY.

[In preparing abstracts of mineralogical papers it has been thought right to adhere as far as possible to whatever system of nomenclature, chemical notation, and crystallographic formulæ may have been used by the authors. No attempt has therefore been made to secure uniformity on these points. Where two or more symbolical expressions for the same thing have been used, the first has generally been taken. Exceptions to the foregoing rules have in some cases been made in order to avoid typographical difficulties.—F. W. R.]

ACHIARDI, A. D'. Della Natrolite (Savite) e Analcima di Pomaja. [On Natrolite and Analcime from Pomaja.] Boll. R. Com. geol. Ital. pp. 163–165.

Supposes that these minerals have been formed by aqueous extraction from labradorite, which, by the abstraction of soda, alumina, and lime, might be left as steatite, a third mineral associated with them. E. B. T.

——. Le Zeoliti del Granito elbano. [Note on Zeolites in Granite of Elba.] Boll. R. Com. geol. Ital. pp. 306–312 (2 woodcuts of crystals).

The author determined the presence of stilbite and heulandite in Elban granite; figures of the crystalline form of the latter are given; and it is suggested that they represent a triclinic variety. What has been since named *Foresite* by Vom Rath was determined previously by the author as allied to *Cookeite*. E. B. T.

ANDREWS, Prof. THOMAS. On the Composition of an Inflammable Gas issuing from below the Silt-bed in Belfast. Proc. Belfast Nat. Hist. & Phil. Soc., Session 1873–74, pp. 93, 94.

The gas was found in making a well, through 33 feet of silt and 7 feet of gravel, to clay; and it had accumulated at the junction of the silt and gravel. It consists of marsh-gas, with nitrogen, carbonic acid, and oxygen. W. W.

ANGELL, A., Jun. Notes on the Probable Origin of Flints. Journ. Winchester Sci. & Lit. Soc. vol. i. part 3, pp. 146–151.

The author thinks that the dark colour of chalk-flints is due to organic remains, and that the layers of flints may have been produced by the silicification of protoplasmic matter, which was deposited in the bottom of the deep sea at times when the water contained hardly any lime-salt in solution, from colder changes of current. Difficulties in other theories are noticed. W. W.

ANON. [TSCHERMAK?] Glauberit von Priola in Sizilien. Min. Mitt. Heft 2, p. 179.

Notes the occurrence of glauberite with gypsum, near Priola, in Sicily. The crystals exhibit the simple forms 001, 111.

——. [TSCHERMAK?] Quarz von der Saualpe. Min. Mitt. Heft 4, pp. 284, 285, with 2 woodcuts.

Describes crystals of quartz occurring as enclosures in the Carinthine (hornblende) of the eclogite-rock from the Sau Alp in Carinthia. The crystals are formed almost wholly of the fundamental rhombohedron; but faces of another rhombohedron and of a prism occur subordinately. The crystals are optically left-handed. F. W. R.

Anon. Note Mineralogiche. [Mineralogical Notes.] Boll. R. Com. geol. Ital. pp. 31–49, 98–100.

Notice of new minerals, descriptions of which have appeared in the last year or two in various publications. Similar notices of minerals described in German publications of 1873 occur at pp. 168–171, 393, 394. E. B. T.

——. On a New Mexican Mineral. Amer. Journ. ser. 3, vol. vii. p. 75.

Note giving characters of mineral described by Don Pedro L. Monroy from Coneto mine, near Durango (see La Naturaleza, i. p. 76).

——. Notes on the Iron and Steel Industries of the United Kingdom. Journ. Iron & Steel Inst. no. 1, pp. 242–280, no. 2, pp. 475–502.

Notes of ores.

——. [F. W. Rudler.] Quart. Journ. Sci. pp. 122, 123, 264–266, 409–411, 540.

Quarterly Reports on the Progress of Mineralogy.

Areitio y Larrinaga, Don Alfonso de. Datos para el estudio de la fosforescencia. An. Soc. Españ. Hist. Nat. vol. iii. part 1.

Gives the results of observations made with over 100 rocks from different parts of Spain, in order to ascertain their phosphorescent properties, and confirms the non-phosphorescence of pyramidal crystals of apatite asserted by Haüy. Mentions having observed only slight indications of phosphorescence in pyramidal crystals of orthoclase. J. M‘P.

——. Observaciones al folleto intitulado estudio y descubrimiento del Bismuto en el Estado de San Luis de Potosi por Don Florencio Cabrera. An. Soc. Españ. Hist. Nat. vol. iii. part 1.

According to the author, M. Cabrera has discovered crystallized bismuth-ochre at San Luis de Potosi, which, however, cannot be reckoned a new species of mineral, as proposed by Cabrera. J. M‘P.

——. Estudio sobre la Auricalcita de Udias (Santander). An. Soc. Españ. Hist. Nat. vol. iii. part 3.

Analysis of the Aurichalcite of Udias in the Province of Santander, never before found in Spain.

Argall, William. On the occurrence of wood-tin ore in the Wheal Metal lode at Wheal Vor, in Breage. Journ. Roy. Inst. Cornwall, no. xv. pp. 255, 256.

Wood-tin was found in the lode at 180 fathoms from the surface a few years ago; and lately ore of much the same character has been found 200 fathoms deep and 80 fathoms further east, on the same lode. C. L. N. F.

Arzruni, Dr. A. Ueber eine Zwillingsverwachsung des Willemit. [Twins of Willemite.] Pogg. Ann. Bd. clii. p. 281.

A specimen from Altenberg, near Aachen, exhibited the forms ∞R and $\frac{3}{4} R$. The crystals were twinned according to the law, twin-plane a face of the pyramid of the second order $\frac{8}{5} P 2$. F. W. R.

Atterberg, A. Om ett selenhaltigt mineral från Falu grufva. [Seleniferous mineral from the Falun mine.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 76–78.

Analysis given, and the following formula suggested :—Bi_3PbS_2.

Barcena, Mariano. On Livingstonite, a new mineral. Amer. Journ. ser. 3, vol. viii. pp. 145, 146.

Abstract from paper in 'El Minero Mexicano,' May 1874.

Bauer, Max. [Seebachite.] N. Jahrb. Heft 5, pp. 522–524.

Two analyses of a zeolite from Victoria, described as Herschelite, have been made at Göttingen. These lead to the formula $(Na_4Al_2Si_7O_{22} + 12H_2O) + 3(Ca_2Al_2Si_7O_{22} + 12H_2O)$; whence it is concluded that the zeolite is not Herschelite, but a new species for which the name *Seebachite* is proposed. F. W. R.

——. Mineralogische Mittheilungen. Zeitsch. deutsch. geol. Ges. Bd. xxvi. Heft 1, pp. 119–198, with 3 plates (crystals).

A continuation of the author's mineralogical communications, including descriptions of rare forms of crystals of garnet, the physical characters of micas, the optical properties of margarite and some other mica-like minerals, a peculiar twin-striation on iron-glance, and a remarkable crystal of smoky quartz from Galenstock in Wallis, apparently exhibiting basal plane. F. W. R.

Baumhauer, Heinrich. Die Aetzfiguren am Kaliglimmer, Granat, und Kobaltnickelkiese. [Etched figures on minerals.] Sitzungsb. math.-phys. Classe k. b. Ak. Wiss. Heft iii. pp. 245–251, with woodcuts.

Descriptions of experiments in developing figures by acting on potash-mica with fluor-spar and sulphuric acid, on garnets with fused caustic potash, and on cobalt-nickel pyrites with boiling nitric acid.
F. W. R.

——. Weitere Mittheilungen über Aetzfiguren an Krystallen. [Etched figures on crystals.] Pogg. Ann. Bd. cliii. pp. 75–80, plate.

Observations on the alums, borax, augite, and orthoclase.

——. Bemerkung zu dem Aufsatze des Hrn. Dr. F. Exner über die Lösungsfiguren an Krystallflächen. [Etched figures on crystals.] Pogg. Ann. Bd. cliii. pp. 621, 622.

The figures developed by etching the face of a crystal may be independent of the direction of cleavage.

Behrens, H. Die Krystalliten: mikroskopische Studien über verzögerte Krystalbildung. 8vo. Kiel. Pp. 115, 2 plates.

Two kinds of crystallites are recognized, and probably two methods of formation of crystals; in one the growth is continuous, in the other discontinuous. On observing, under high magnifying-power, crystallization from watery and alcoholic solutions, the author finds that minute but well-formed crystals separate at once from the solution; and he never observed the formation of globulites, as described by Vogelsang. F. W. R.

Berwerth, Dr. F. Ein Umwandlungsprodukt des Ludwigit. Min. Mitt. Heft 3, pp. 247–250.

Tschermak's new species, *Ludwigite*, from Morawitza, in the Banat, is associated in some specimens with a brownish-red substance, which is a product of alteration of the Ludwigite, and consists of hydrous peroxide of iron, associated apparently with small quantities of brucite, magnetite, talc, and calcite. Analyses of the Ludwigite and of the alteration-product are given. F. W. R.

Blake, James. On Nickeliferous sand from Frazer River. Amer. Journ. ser. 3, vol. vii. p. 238.

Condensed note from Proc. Calif. Acad. Sci. vol. v. p. 200 (? 1874).

Blake, William P. Wood-tin in Georgia. Amer. Journ. ser. 3, vol. viii. p. 392.

Note of the discovery of minute grains of wood-tin in the residual black sand from the sluices used in collecting gold, from the Nacoochee valley, White County, Georgia. The usual minerals in the black sand of Dahlonega, Georgia, are specular iron, magnetite, ilmenite, rutile, cyanite, and garnet. G. A. L.

Blomstrand, C. W. *Manganosit*, ett nytt mineral från Vermland. [*Manganosite*, a new mineral from Wermland.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 179–183.

The composition of *Manganosite* is—protoxide of manganese 98·04, protoxide of iron 0·42, magnesia 1·71, lime 0·16, = 100·33.

Blum, Dr. J. Lehrbuch der Mineralogie (Oryktognosie). Ed. 4. Pp. xv, 642, with 457 woodcuts. Stuttgart.

Brauns, Dr. D. Ueber Hahn's Entwickelung der Ansichten über die chemische Constitution der natürlichen Silikate. Zeitsch. gesam. Nat. (new ser.) Bd. x. pp. 502–505.

Criticism of Dr. Hahn's paper on the development of views on the chemical constitution of natural silicates.

Breithaupt, Hermann. Zur Asymmetrie der tesseralen Krystallgestalten. N. Jahrb. Heft 4, pp. 403, 404.

Letter stating that Prof. Breithaupt had just before his death dictated an essay to show that crystals of certain mineral species belonging to the regular system may be asymmetrically developed. F. W. R.

Brezina, Dr. A. Anthophyllit von Hermannschlag. Min. Mitt. Heft iii. p. 247.

Analysis of a fibrous anthophyllite from Hermannschlag, in Moravia.

——. Guarinit. Min. Mitt. Heft iv. pp. 285, 286, with woodcut.

Calls attention to Prof. Guiscardi's original MS. (1856), in which he referred the crystals of Guarinite to the rhombic, not tetragonal, system. These early observations have been confirmed by Von Lang's optical researches. Guiscardi's measurements are given, and compared with those of Von Lang. F. W. R.

Broadhead, G. C. Note on Pickeringite from Missouri. Amer. Journ. ser. 3, vol. vii. p. 520.

The Pickeringite occurs in efflorescences on sandstone of the Lower Coal Measures in Barton Co. An analysis by Mr. R. Chauvenet gives the composition—sulphuric acid 33·77, alumina 16·58, magnesia 2·92, water 44·64, =97·91. G. A. L.

Burkart, Dr. Ueber das Vorkommen verschiedener Tellur- und Wismuth-Minerale in den Vereinigten Staaten von Nordamerika. [Minerals of Tellurium and Bismuth in the United States.] N. Jahrb. Heft i. pp. 29–32.

Calls attention to the occurrence of these minerals at the Sugar-loaf Mountain and elsewhere in Colorado. Gives localities of bismuth-ores in Mexico. Notices a Mexican mineral regarded by Del Castillo as a new species (*Tapalpita*). Rammelsberg's analysis leads to the formula $Ag_2SBi_2Te_2$; but it is uncertain whether it is a definite compound or a mixture. F. W. R.

——. Ueber neue mexicanische Fundorte einiger Mineralien. [Mexican localities.] N. Jahrb. Heft vi. pp. 587–599.

Notices the occurrence of precious opal, native arsenic, and native platinum at some new localities in Mexico.

——. [Silver, borax.] N. Jahrb. Heft vii. pp. 715–720.

Two letters calling attention to Prof. Church's analyses of native silver [p. 226], and to the occurrence of borax, in California and Nevada. F. W. R.

Cabell, J. A. Analysis of Allanite, from a New Virginia locality. Chem. News, vol. xxx. no. 773, p. 141.

Specimens from Amherst County yielded:—silica 31·23, alumina 16·45, ferric oxide 3·49, ferrous oxide 13·67, cerous oxide 11·24, lanthanum and didymium oxides 9·9, yttria 1·65, glucina 0·24, lime 8·69, magnesia 0·22, and water 2·28, =99·06. F. W. R.

Carnot, Ad. Sur la découverte d'un gisement de Bismuth en France. [Discovery of Bismuth in France.] Compt. Rend. t. lxxviii. pp. 171–174; and Ann. Chim. Phys. ser. 5, t. iii. pp. 454–470, with the addition "et sur quelques minéraux trouvés dans ce gisement."

Native bismuth and sulphide and oxide of bismuth were found for the first time in France by the author and M. Veny in 1869, in a vein of quartz running through granite, near Meymac, in the Department of of Corrèze. The minerals associated with the bismuth-ores are wolfram, mispickel, scheelite, &c. G. A. L.

Carnot, Ad. Sur quelques minéraux de bismuth et de tungstène de la mine de Meymac (Corrèze). [Minerals of Bismuth and Tungsten from the Meymac mine.] Compt. Rend. t. lxxix. pp. 302–306.

Analyses of varieties of Bismuthine and Bismuthite are given.

——. Sur quelques minéraux de bismuth de Meymac (Corrèze). [Bismuth minerals from Meymac.] Compt. Rend. t. lxxix. pp. 477–479.

Analyses are given of Native Bismuth, Oxide of Bismuth, and Bismuthiferous Mispickel from Meymac.

——. Sur quelques minéraux de tungstène de Meymac (Corrèze). [Tungsten-minerals from Meymac.] Compt. Rend. t. lxxix. pp. 637–640.

Analyses of Wolfram, Scheelite, and of hydrated Tungstic Acid from Meymac.

Castillo, Ant. del. Ueber eine neue Mineral-Species des Wismuths. [New bismuth-mineral.] N. Jahrb. Heft iii. pp. pp. 225–229.

Communication from the late Dr. Burkart referring to a Mexican mineral described by Del Castillo as a double selenide of bismuth and zinc. A portion examined by Professor Rammelsberg contained bismuth, selenium, iron, and perhaps zinc. F. W. R.

Church, Prof. A. H. Analysis of Ashantee Gold. Chem. News, vol. xxix. no. 754, p. 199.

An analysis of a fair sample of the native gold of Ashantee gave in 100 parts—gold 90·055, silver 9·940, iron trace, copper very minute trace. Sp. grav. of the gold at 16° C.=17·55. F. W. R.

——. Analyses of Scotch Gold. Chem. News, vol. xxix. no. 755, p. 209.

Some clean grain-gold lately washed from a burn at Wanlockhead, Dumfriesshire, was found to have the following percentage composition—gold 86·60, silver 12·39, iron 0·35. Sp. grav. at 16°=16·5. An assay is added of a specimen of gold from Sutherland, by Mr. G. H. Makins. This gave—gold 79·22, silver 20·78. Sp. grav. at 16°=16·62. F. W. R.

——. Analyses of Native Silver. Chem. News, vol. xxix. no. 756, p. 225.

Two specimens of so-called native silver from Allemont, in Dauphiné, purchased at Heuland's sale in 1824, were analyzed, with the following results: one specimen gave, silver 71·69, mercury 26·15, antimony, with traces of arsenic, 2·16; the other specimen yielded, silver 73·39, mercury 18·34, antimony, with traces of arsenic, 8·27. F. W. R.

CHURCH, Prof. A. H. Beryls and Emeralds. Quart. Journ. Sci. no. xliv. pp. 505–508.

A general description of these gems, with special reference to Mr. Williams's recent researches on the colour of the emerald.

CLEMENCIN, P. M. La Wollastonita no es el bisilicato de Cal. [Wollastonite not a bisilicate of lime.] Revista Minera, xxv. pp. 223–225.

Calls attention to the confusion introduced by calling such silicates as Wollastonite bisilicates. The formula of this species may be written $3CaO . 2SiO_3$, in which case it corresponds to a sesquibasic silicate of lime; or it may be written $CaO . SiO_2$, which is the formula of a neutral silicate. F. W. R.

CLEVE, P. T. Om mineralet Cuban. [On Cubane.] Geol. fören. Stockholm Förhandl. bdt. i. p. 105.

Gives three analyses, by T. O. Carlin, A. W. Brodin, and G. Lindström, of Cubane from Tunaberg and Kafveltorp, both new localities. The formula deduced is $(2FeS . Cu_2S)Fe_2S_3$. G. A. L.

——. Om koboltkis (Linneit) från Bastnäs och Gladhammar. [On cobalt-pyrites (Linnéite) from Bastnäs and Gladhammar.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 125, 126.

Analyses of this mineral from both localities are given, the resulting formula being RS,R_2S_3. Gladhammar in Småland is a new locality for Linnéite, where it was found by G. Lindström. G. A. L.

COOKE, JOSIAH P., Jr. The Vermiculites: their crystallographic and chemical relations to the micas; together with a discussion of the cause of the variation of the optic angle in these minerals. Proc. Amer. Ac. n. ser. vol. i. pp. 35–67, with 9 woodcuts. Reprinted in Phil. Mag. no. 312, pp. 241–272. Full abstract in Amer. Journ. ser. 3, vol. viii. pp. 420–437.

Uses *Vermiculite* as a family-name to include the minerals Jefferisite, Culsageeite, and Hallite. These are hydrous silicates, forming a group parallel with the micas, and differing from the magnesian micas chiefly in containing a definite number of molecules of water of crystallization. Seeks to show that the remarkable exfoliation of the vermiculites when heated is due to the escape of this water. Jefferisite, Culsageeite, and Hallite correspond respectively with the two varieties of Biotite and with Phlogopite. Describes twin-forms, and refers to this twinning in explanation of the great variation in the optic angle exhibited by the vermiculites, ripidolites, and certain micas. Speculates on the molecular structure of such crystals. By process of twinning, uniaxial crystals of hexagonal type may be constructed from rhombic crystals with angles of 60° and 120°. Suggests that hexagonal crystals of other minerals may be similarly developed.

The Phil. Mag. reprint is prefaced by a letter calling attention to the optical results. In Amer. Journ. vol. viii. p. 139, is a note acknowledging the priority of some of Reusch's researches on circular polarization. F. W. R.

Corenwinder, B. Sur l'origine des efflorescences de sulfate de chaux dans le voisinage des eaux sulfureuses de Luchon. [Origin of efflorescent sulphate of lime in the neighbourhood of the sulphurous waters of Luchon.] Ann. Soc. Géol. Nord, 1870-74, p. 29.

Refers the origin to the action of hydrosulphuric acid on carbonate of lime.

Courtis, W. M. The Wyandotte Silver Smelting and Refining Works. Trans. Amer. Inst. Min. Eng. vol. ii. p. 89.

Notice of minerals observed, p. 91. Analyses of ores, p. 92.

Credner, H. [Antimony-ore.] Sitzungsb. naturf. Gesell. Leipzig. [Noticed in N. Jahrb. Heft vii. pp. 740, 741.]

Announces the discovery of a vein of antimony-glance in granulite on the western side of the Eichberg in Saxony.

Dana, E. S. Ueber Datolith. Min. Mitt. Heft i. pp. 1-6, with plate; and Amer. Journ. ser. 3, vol. viii. pp. 68, 69.

Crystallographic description of datolite. The datolites of Arendal, Andreasberg, Toggiana, and Bergen Hill are described, and several new faces are mentioned. All the observed forms are tabulated, with the more important angles. F. W. R.

——. Morphologische Studien über Atacamit. Min. Mitt. Heft ii. pp. 103-108, with woodcut; and Amer. Journ. ser. 3, vol. viii. p. 69.

Morphological observations on Atacamite from Wallaroo, South Australia. A large number of measurements of crystals are tabulated.

——. Calcitdrilling nach 2R. Min. Mitt. Heft ii. p. 180, with woodcut.

A specimen of calcite from Dognazka, in Hungary, exhibited the acute rhombohedron $\frac{1}{4}$R. In addition to several twins, a group of three individuals occurred; and as the angle between two corresponding faces is about 92°, the plane of combination is +2R. F. W. R.

Dana, Prof. J. D. On Serpentine Pseudomorphs and other kinds from the Tilly Foster Iron Mine, Putnam Co., New York. Amer., Journ. ser. 3, vol. viii. pp. 371-381, 447-459, with 2 plates.

Geological Structure of the region:—1, Archæan rocks. 2. Ore-bed. 3. Veins in the ore-bed. 4. Minerals of later origin, resulting from alterations of the older minerals, or in other ways. *The Pseudomorphs and their teachings*:—1, of Serpentine, or of serpentine and dolomite. These are cubic, the form being perfect, but the mass partly serpentine, partly dolomite, with cubical cleavage, after some mineral like galena; or hexagonal, probably after calcite; others after apatite, chlorite, chondrodite, enstatite, biotite, dolomite, and brucite. 2, of Brucite, after dolomite. 3, of Magnetite after dolomite, chondrodite, &c. 4, of

Pyrrhotite. 5, of Dolomite. All the serpentine is said to result from the alteration of magnesian minerals. G. A. L. and E. B. T.

DANA, Prof. J. D., and GEORGE J. BRUSH. A System of Mineralogy. Descriptive Mineralogy, comprising the most recent discoveries. Fifth edition, 3rd sub-edition, with Appendix and Corrections. London and New York. Pp. xlviii, 827, iv, Appendix pp. 19.

DAUBRAWA, HEINRICH. Zur Kenntniss des Albites (Natronfeldspath). Zeitsch. gesammt. Nat. new ser., Bd. ix. pp. 37–39, one plate of crystals.

Crystallographic description of twins of albite from Moravia. The combinations contain the following faces—$\infty P \breve{\infty}$. $0P$. $\infty{}'P$, $\infty P'$. $\infty{}'\breve{3}$. $\infty P'\breve{3}$. $'P'\bar{\infty}$. F. W. R.

DES CLOIZEAUX A. Manuel de Minéralogie. T. ii. Premier fascicule. Pp. 208. 8vo. Paris.

DOELTER, Dr. C. Hartz aus der Braunkohle von Dux. [Resin from the Brown Coal of Dux.] Verh. k.-k. geol. Reichs. pp. 145, 146.

Describes a deposit of resin, and gives a chemical analysis.

DÖLL, E. Neue Pseudomorphosen. Min. Mitt. Heft i. pp. 85–88.

Notes on the following newly observed pseudomorphs—fassaite after idocrase; native silver after pyrargyrite; proustite after stephanite and argentite; marcasite after bournonite, copper-pyrites, and magnetic pyrites. F. W. R.

——. Tellurwismuth im Banate. Min. Mitt. Heft i. p. 91.

Records the occurrence of telluric bismuth in the Theresia Mine, Oravitza, and of native tellurium in the Elizabeth Mine, Oravitza.

DOMEIKO, IGNACIO. Sur les solfatares latérales des volcans du Chili et sur quelques nouveaux minéraux. [On the lateral Solfataras of the volcanoes of Chili, and on some new minerals.] Compt. Rend. t. lxxviii. pp. 328, 339.

Abstract of two papers presented to the Academy.

——. Cuarto Appendice al Reino Mineral de Chile y de las Republicas vecinas, publicado en la segunda edicion de la Mineralogia. [4th Appendix to the Mineral Kingdom of Chile and of the neighbouring Republics, published with the second edition of Don I. Domeyko's Mineralogy.] 58 pp. 8vo. Santiago.

DRAŽOEVIĆ-JELIC, G. Analisi dei cinque principali Asfalti Dalmati. Spalato.

DUCLOUX, X. Nota sobre una nueva especie mineralógica de la Provincia de Lérida. [New mineral species from Lerida.] Revista Minera, xxv. pp. 243–245; and Compt. Rend. t. lxxviii. pp. 1471–1473.

This mineral occurs in compact masses in limestone on the western side of the Sierra del Cadí. It has been called *Rivotite*, in memory of the late M. Rivot. The author's analysis leads to the following formula—$Sb_2O_5 + 4\,(Cu, Ag)\,O \,.\, CO_2$. F. W. R.

Dunn, E. J. Notes on the occurrence of Enhydros, or Water-stones, at Beechworth. Trans. Roy. Soc. Victoria, vol. x. pp. 32–35, with plan and sections.

The *enhydros* consist of chalcedony, having a hardness equal to that of topaz; they are irregular polyhedra, and vary from a dark brownish yellow to colourless; some of the faces are striated, and others pitted. They are generally hollow, and enclose a liquid with a moveable bubble like that in a spirit-level. The shell is usually thin, and either smooth on the inside, or studded with globules of chalcedony or crystals of quartz. Mr. Dunn suggests that the great hardness of the chalcedony may be due to the presence of a small proportion of alumina, and the quartz may have crystallized in the interior after the enclosed fluid had deposited its impurities. The enhydros occur in granite and in Silurian sandstone at Spring Creek, near the town of Beechworth. F. W. R.

Eck, H. [Milarite]. N. Jahrb. Heft i. pp. 61, 62.

Gives analysis of this species.

——. N. Jahrb. Heft vi. pp. 611, 612.

Note on crystals enclosed in the biaxial mica of Pennsylvania.

Egger, A. J. Ripidolith aus dem Zillerthal. Min. Mitt. Heft iii. p. 244.

Analysis of Breithaupt's Onokite, a variety of Ripidolite, from the Zillerthal.

Egleston, T. Systems of Notation of Crystals. Proc. Lyc. Nat. Hist. N. York, ser. 2, no. 4, pp. 135, 136.

Abstract. An account of the various systems in use.

——. On the striations of Crystals. Proc. Lyc. Nat. Hist. N. York, ser. 2, no. 4, pp. 146, 147.

Abstract. Nature and causes of the phenomenon discussed. The principal cause "is what may be termed the 'oscillation' between two distinct crystalline forms." G. A. L.

Eilers, A. A new occurrence of the Telluride of Gold and Silver. Trans. Amer. Inst. Min. Eng. vol. i. pp. 316–320.

The new locality is Red-Cloud Mine, Gold-Hill District, Colorado. The country-rock is granitic. Assays of ore are given.

Erdmann, E. Zinkblende funnet i Skånes stenkolsförande formation. [Zincblende in the coal-bearing formation of Scania.] Geol. fören. Stockholm Förhandl. bdt. ii. p. 48.

Note of occurrence.

Everwijn, R. Looderts in het landschap Kandawangan Westerafdeeling van Borneo. Jaarb. Mijn. Ned. O.-Ind. Jaarg. 3, Deel 1, pp. 171, 172.

Lead-ore occurs in quantity on a tributary to the river Kandawangan, in Western Borneo. A specimen yielded 81·02 per cent. of lead, and 0·076 of silver. The fragments of ore on the surface point to the existence of a considerable lode. F. W. R.

Everwijn, R. Over het voorkomen van goud in de residentie Cheribon op Java. Jaarb. Mijn. Ned. O.-Ind. Jaarg. 3, Deel 1, pp. 174, 175.

Gold is washed on the coast in Cheribon, Java. It is associated with magnetic iron, sand, and cinnabar.

Exner, Dr. F. Ueber Lösungsfiguren an Krystallflächen. [Figures dissolved on faces of crystals.] Pogg. Ann. Bd. cliii. pp. 53–62.

Experiments on the differences in the rapidity of solution in different directions in the faces of various crystals.

Feuchtwanger, Dr. L. Baryta, its manifold uses in the Arts. Read before Polytech. Club, Amer. Inst. Journ. Soc. Arts, vol. xxii. pp. 785, 786.

Foord, George. Notes on Enhydros found at Beechworth. Trans. Roy. Soc. Vict. vol. x. pp. 71–76, with two plates.

Describes the liquid obtained from the cavities of a specimen of *enhydros*, or "water-stone." It consists of clear water containing in solution a small proportion of certain salts, apparently the chlorides and sulphates of sodium, magnesium, and calcium. He believes that a soluble form of silica is also present. The accompanying plates show the crystalline forms of the saline constituents obtained on evaporation, and the crystalline structure of laminæ forming the walls of one of the enhydros. The probable origin of these water-stones and their bearing upon the formation of mineral-veins are discussed. F. W. R.

——. On a specimen of Native Copper recently found at Footscray, near Melbourne. Trans. Roy. Soc. Vict. x. pp. 131–135.

A large mass of nearly pure arborescent metallic copper was picked up on the banks of the Yarra-Yarra river, at Footscray, amongst loose fragments of weathered "bluestone" or basalt, of which the banks of the river are composed. R. E., Jun.

Forbes, D. Report on the Progress of the Iron and Steel Industries in foreign countries. Journ. Iron and Steel Institute, no. 1, 1874, pp. 174–241; no. 2, 1874, pp. 410–474.

Notes of ores.

Foster, Dr. C. Le N. Notes on some new Uranium Ores from Saxony. Rep. Miners' Assoc. Cornwall and Devon for 1873, pp. 40, 41.

This is an abstract of Prof. Weisbach's paper in the 'Jahrb. Berg- und Hüttenwesen im Königreiche Sachsen, 1873,' and gives the composition and general charaters of Trögerite (hydrated arseniate of uranium), Walpurgin (hydrated arseniate of uranium and bismuth), Zeunerite (hydrated arseniate of uranium and copper), Uranospinite (hydrated arseniate of uranium and calcium), Uranospherite (hydrated oxides of uranium and bismuth). These minerals were probably formed by the action of water and oxygen on pitchblende, smaltine, and native bismuth. C. L. N. F.

Frazer, Prof. P., jun. [Remarks on the variations in different analyses of the same mineral, and the difficulty in forming any conception of the mutual chemical relations of the elementary components of minerals.] Proc. Ac. Nat. Sci. Philadel. part ii. pp. 92–94, 110–115.

Fredholm, K. A. Några mineralogiska iakttagelser från trakten kring Nyköping. [Mineralogical observations from places about Nyköping.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 53, 54.

The minerals mentioned are Hisingerite, black tourmalin, sea-green felspar.

——. Opal från zirkonsyeniten vid Fredriksværn i Norge. [Opal from zircon-syenite near Fredriksværn, Norway.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 131–148.

Note of occurrence.

Frenzel, August. Famatinit und Wapplerit. Min. Mitt. Heft iv. pp. 279, 280.

Famatinite from Luzon has been separated as a distinct mineral (*Luzonite*), in consequence of its containing arsenic instead of antimony. Famatinite from Peru contains about equal proportions of arsenic and antimony; and its name is therefore doubtful. Frenzel describes a hydrous arsenate of lime from Joachimstahl, in Bohemia, as a new species under the name of *Wapplerite*, after Herr Wappler of Freiberg. It occurs in minute white transparent crystals, probably monoclinic; and its composition may be expressed by the formula $2CaO.As_2O_5 + 8H_2O$, in which Ca is partially replaced by Mg. F. W. R.

——. Mineralogisches. N. Jahrb., Heft vii. pp. 673–686.

Gives the name of *Miriquidite* to a mineral from Schneeberg, in Saxony, which occurs in small rhombohedral blackish-brown crystals, whilst a massive variety is brown with a yellow streak. No complete analysis has been made; but the mineral contains oxide of lead, peroxide of iron, phosphoric and arsenic acids, and water. The other mineralogical notes describe:—the minerals accompanying the brown iron-ore of Langenstriegis in Saxony; a substance incrusting certain pseudomorphs of iron-pyrites after magnetic pyrites from Freiberg, which resembles *neolite*; the *arsenic-glance* of Marienberg, merely an impure native arsenic, his analysis giving 95·86 per cent. of that metal; a *selenium-bismuth glance* from Guanaxuato, for which he gives the formula $2Bi_2Se_3+Bi_2S_3$; a mineral from Rezbanya, referred to *Cosalite*, with a composition represented by $2PbS+Bi_2S_3$; a new analysis of *Cabrerite*, which leads to the formula, $3(NiO_2, MgO)\ As_2O_5+3H_2O$; an analysis of a Russian iron-platinum, $FePt_2$; the occurrence of *Famatinite*; and the artificial production of iron-glance by igniting ferric hydrate. F. W. R.

Frenzel, August. Mineralogisches Lexicon für das Königreich Sachsen. [Mineralogical Lexicon for Saxony.] Pp. vi, 380. Leipzig.

Friedel, C. Sur la Delafossite. Compt. Rend. 2 sess. Assoc. Franç. pp. 384, 385.

Of 6 specimens of this mineral known, 2 in the School of Mines at St. Petersburg are labelled as coming from Cumnock, in Ayrshire. The author doubts the correctness of this locality, as the other specimens known come from Perm, in Russia. G. A. L.

Frohwein, Herr. [Cinnabar at Dillenburg.] Zeitsch. deutsch. geol. Gesel. Bd. xxvi. Heft 3, pp. 609–611.

Letter recording the occurrence of cinnabar in the copper-lode of the Fortunatus mine, near Dillenburg, and also in the country-rock in the neighbourhood of the lode. F. W. R.

Genth, F. A. Ueber Korund, seine Umwandlungen, und die ihn begleitenden Mineralien. [Corundum, its alterations and its associates.] Journ. prak. Chem. N. S., Bd. ix. pp. 49–112.

Translation from Amer. Phil. Soc. 1873.

——. Ueber Nordamerikanishe Tellur- und Wismuth-mineralien. Journ. prak. Chem., N. S. Bd. x. pp. 355–368.

Translation of a paper read to Amer. Phil. Soc. Aug. 21, 1874. Describes occurrences of native tellurium, tetradymite, altaite, hessite, petzite, sylvanite, calaverite, and bismuth-glance. Also describes as new species a tellurate of copper and lead, and a sulphide of bismuth, silver, and lead; the latter is named *Schirmerite*, after Director Schirmer, of Denver, and contains $PbS . 2Ag_2S . 2Bi_2S_3$. A postscript throws doubt on the two species described by Endlich as Schirmerite and Henryite. Maintains that Endlich's Schirmerite is only an impure Petzite. F. W. R.

——. Reply to Dr. T. Sterry Hunt. Amer. Journ. ser. 3, vol. viii. pp. 221–223.

A reply to charges made with reference to Dr. Genth's researches on Corundum and its associated minerals in Proc. Boston Soc. Nat. Hist. vol. xvi., March 4th, 1874.

Goldsmith, E. Analyses of Graphite from Wythe County, Virginia. Proc. Ac. Nat. Sci. Philadel. part ii. p. 77.

A very impure graphite, softer than talc, containing a large proportion of silica, alumina, and iron-oxides, a trace of manganese, and a considerable quantity of undetermined gas. A. H. G.

——. On the composition of Trautwinite. Proc. Ac. Nat. Sci. Philadel. p. 318.

——. Analyses of Chromite from Monterey Co., California. Proc. Ac. Nat. Sci. Philadel. p. 365.

Chromite is compared with Trautwinite; and the latter is believed to have been formed by a combination of silica and lime with the former.

Goldsmith, E. Stibia ferrite, a new mineral from Santa Clara Co., California. Proc. Ac. Nat. Sci. Philadel. p. 366.

Stibia ferrite is described as a hydrated antimoniate of iron. It occurs on stibnite, from which it is probably derived.

Gonnard, F. Des associations zéolitiques dans les laves anciennes de l'Auvergne. [Zeolitic associations in the ancient lavas of Auvergne.] Compt. Rend. 2 sess. Assoc. Franç. pp. 379–382.

The zeolitic minerals of Auvergne comprise the following—mesotype, mesolite, scolezite, analcime, phacolite, christianite, laumonite, mesole, apophyllite; calcite, arragonite, giobertite, chalcedony, bitumen, &c. also occur. Analysis of mesole from Chaux-de-Bergonne and of christianite from Cap-de-Prudelles, both by M. Pisani, are given.
G. A. L.

Gould, C. On specimens of Rutile, Anatase, and Brookite found in Tasmania. Monthly Notices Roy. Soc. Tasman. for 1873, p. 57.

These minerals are recorded from Clayton Rivulet, N.W. coast of Tasmania, in a drift derived from the destruction of metamorphic rocks. Kyanite, rubies, and sapphires were also found near the same locality.
R. E., Jun.

Gouvenain, — de. Sur la dissémination de l'étain et sur la présence du cobalt et de diverses autres substances dans les Kaolins de Colettes et d'Echassières situées dans le département de l'Allier. [Presence of tin, cobalt, &c. in the Kaolins of the department of the Allier.] Compt. Rend. t. lxxviii. pp. 1032–1034.

Tin, cobalt, and nickel have been found in this china-clay in the proportion (at Colettes) as to tin of about 26 lbs. of ore to 1050 cubic feet of clay. An appreciable quantity of cobalt was obtained, and a trace of nickel.
G. A. L.

Groth, Paul. Ueber die Krystallform und die thermoëlektrischen Eigenschaften des Speiskobalt. [Crystallization and thermo-electric properties of Speiskobalt.] Pogg. Ann. Bd. clii. pp. 249–255.

Shows that this species (smaltine) is not holohedral, but that, like iron-pyrites and cobaltine, it is pentagonal-hemihedral. Most of the crystals are thermo-electrically negative towards copper; but some are positive. Being isomorphous with iron-pyrites and cobaltine, the formula of Speiskobalt should be $(Co, Ni, Fe) As_2$.
F. W. R.

——. Tabellarische Uebersicht der einfachen Mineralien nach ihren krystallographisch-chemischen Beziehungen geordnet. Brunswick. Pp. 120.

In 3 parts. The first gives a general survey of the groups; the second contains the tables of minerals; and the third consists of general remarks, especially on the relation between crystalline form and chemical composition.
F. W. R.

——. Ueber die Bezeichnung der hexagonalen Krystallformen. Min. Mitt. Heft iii. pp. 223–226, woodcut.

Compares the methods of Naumann, Miller, and Schrauf for indicating the forms of the hexagonal system, and shows how Miller's method may be applied to this system so as to bring the symbols into relation with those of the tetragonal system. F. W. R.

Gumælius, Otto. Quarts och bergkristaller i kornig kalksten. [Quartz and rock-crystal in granular limestone.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 31, 32, 1 fig. in text.

Analysis given and petrological description. From localities in the Örebro district.

——. Cuprit från Bengtstorp. [Cuprite from Bengtstorp.] Geol. fören. Sockholm Förhandl. bdt. ii. p. 126.

——. Mineral från Bjelkes grufva på Areskutan. [A mineral from the Bjelkes mine in Areskutan.] Geol. fören. Stockholm Forhandl. bdt. ii. pp. 127, 128,

Analysis given. Formula, $RO.SO_3+R_2O_3.3SO_3+24HO$.

——. Myrmalm från Järlehyttan. [Bog-ore from Järlehyttan.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 128, 129.

The percentage of iron of this ore was 52.

Habets, A. Les minerais de fer oolithiques du Luxembourg et de la Loraine. Pp. 27, 3 plates. 8vo. Liège.

Reissue of a paper read at the Liège meeting of the Iron and Steel Inst. of Gt. Brit. 1873.

Hagen, Dr. H. A. On Amber in North America. Journ. Ap. Sci. vol. v. no. 56, pp. 122, 123.

Draws attention to an American paper published in 1821, contrasts the formation in which amber occurs in America with that of Prussia, and notices American localities. W. W.

Hahn, Daniel. Die Phosphorescenz der Mineralien. Zeitsch. gesam. Nat. N. ser. Bd. xi. pp. 1–37, 131–213.

After an historical sketch of our knowledge of the phosphorescence of minerals, he describes the phenomena of phosphorescence, of which four kinds are recognized—by heating, by insulation, by electricity, and by molecular disturbance. Results are given of a series of investigations on phosphorescence by heating. F. W. R.

——. Entwickelung der Ansichten über die chemische Constitution der natürlichen Silicate. [Development of views on the chemical constitution of the natural Silicates.] Zeitsch. gesam. Nat. N. ser. Bd. x. pp. 289–338.

An historical essay, giving analyses of the views of ancient and modern chemists on the constitution of mineral silicates.

Hamlin, A. C. Origin and Properties of the Diamond. Proc. Amer. Assoc. vol. xxii. B, pp. 104–108.

Hankel, W. Ueber die thermoelektrischen Eigenschaften des Topases, des Schwerspathes und des Aragonites. Pogg. Ann. Jubelband, pp. 649–661.

General results of investigations on the thermo-electric properties of topaz, barytes, and aragonite.

Harrington, B. J. Notes on Dawsonite, a new carbonate. Can. Nat., N. S. vol. vii. no. 6, pp. 305–309.

Dawsonite occurs in the joints of a trachytic dyke near the western end of M'Gill College, Montreal, and is named after Principal Dawson. Two original analyses are published; and from these the author concludes that Dawsonite " may be a hydrous carbonate of alumina, lime, and soda, or perhaps a compound consisting of a hydrate of alumina combined with carbonates of lime and soda." F. W. R.

Hawes, George W. Contributions from the Sheffield Laboratory of Yale College. No. XX. On a Feldspar from Bamb, in Norway. Amer. Journ. ser. 3, vol. vii. p. 579.

A triclinic felspar, occurring with fluo-phosphate of magnesia and lime (Kjerulfine), when analyzed was found to agree nearly with oligoclase. Its physical properties agree with those of Tschermakite. E. B. T.

Hessenberg, Dr. F. N. Jahrb. Heft viii. pp. 817–853, woodcuts.

An obituary notice of Dr. Hessenberg by Prof. Vom Rath, containing unpublished notes of recent original researches, and notes on the mineral collections of the British Museum and the Museum of Practical Geology, made during Hessenberg's visit to London in 1868. F. W. R.

Hintze, Dr. C. Ueber die chemische Zusammensetzung des Leadhillit's. [Chemical composition of Leadhillite.] Pogg. Ann. Bd. clii. pp. 256–264.

Concludes that the composition of this species is *not* $PbSO_4+3PbCO_3$, as generally expressed, but $2PbSO_4+4PbCO_3+PbO+2H_2O$. Maintains that the new mineral called Maxite is identical with Leadhillite. F. W. R.

Hunt, Dr. T. S. Remarks on an occurrence of tin-ore at Winslow, Maine. Trans. Amer. Inst. Min. Eng. vol. i. pp. 373–375 (with discussion).

The ore is cassiterite, in thin veins traversing micaceous limestone, subordinate to the gneissic series of the White-Mountain series.

——. On Dr. Genth's Researches on Corundum and its associated Minerals. Proc. Bost. Soc. Nat. Hist. vol. xvi. pp. 332–335.

InguNza, Ramon de. Algunas indicaciones sobre la extraña naturaleza de los Coprolitos de Terrer en la Provincia de Zaragoza. Bol. Com. map. geol. Españ. vol. i.

Refers to a deposit of coprolites found at Terrer, in the province of Zaragoza. Analyzes and describes the coprolites. A lithographic plate represents their forms. J. M'P.

Janovsky, J. V. Analyse eines Minerals von Orawicza. Ber. deutsch. Chem. Ges. pp. 109, 110.

Analysis of gehlenite from Orawicza in the Banat. The mineral occurs in nodules with a dark-green nucleus: vesuvian is disseminated through the mass; and samoite forms an external crust. F. W. R.

JENKS, Col. C. W. Note on the occurrence of Sapphires and Rubies *in situ* with Corundum, at the Culsagee Corundum-mine, Macon County, North Carolina. Quart. Journ. Geol. Soc. vol. xxx. pp. 303–306.

Describes the occurrence of corundum at this mine. Corundum Hill is a boss of serpentine protruded through granite. The veins dip about 45° S.E., and consist mainly of chlorite, jefferisite, and corundum. The corundum is in many parts finely coloured and translucent, so as to form sapphire and ruby. This is the first recorded occurrence of such gems in place. F. W. R.

JOHN, K. Magnesiaglimmer vom Baikalsee. Min. Mitt. Heft iii. p. 242.

Analysis of a magnesia-mica from Lake Baikal.

——. Grünerde von Peřimov in Böhmen. Min. Mitt. Heft iii. p. 243.

Analysis of green earth lining cavities in an amygdaloidal melaphyre from Northern Bohemia.

——. Vorkommen eines dem Wocheinit (Beauxit) ähnlichen Minerals in Kokorije. [Occurrence of a mineral resembling Wocheinit (Beauxite) in Kokorije.] Verh. k.-k. geol. Reichs. pp. 289, 290.

JOHNSON, W. H. Note on two pieces of iron cinders from a furnace in which iron is heated. Mem. Lit. & Phil. Soc. Manchester, vol. xiv. p. 13.

Contain crystals of Fayalite, an iron chrysolite, a mineral found in the Mourne Mountains of Ireland.

JOLIN, S. Analys af ett mineral från Delsbo i Helsingland. [Analysis of a mineral from Delsbo, in Helsingland.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 237, 238.

The formula arrived at is $2Al_2O_3+7SiO_2+12HO$.

JONES, Prof. T. R. Flint: its Nature, Character, and adaptability for Implements. Reliquiæ Aquitanicæ, parts xiv., xv. pp. 202–205.

Flint, in one condition or another, is found in most calcareous rocks. It occurs as sheets and as nodules, generally in beds. It is homogeneous, and consists of silica, not so pure however as is the case with quartz. This silica, once in solution, has been accumulated round sponges &c., changing some of the surrounding chalk into its own substance. Flint has yielded fit material for fashioning into tools or weapons, the application of blows and pressure producing sharp flakes; the substance is also capable of being dressed into definite shapes. The surfaces of broken flints suffer changes from exposure and from moisture, becoming opaque and often shining when affected by alkaline water. Concludes with a list of the chief works on the subject.

W. W.

Junghann, Dr. **Gustav**. **Ein einfaches Gesetz für die Entwickelung und die Gruppirung der Krystallzonen.** [Simple law for the development and grouping of crystal-zones.] Pogg. Ann. Bd. clii. pp. 68–95.

Karlsson, V. Titanhaltig magnetit i basalt. [Titaniferous Magnetite in Basalt.] Geol. fören. Stockholm Förhandl. bdt. i. p. 14.

Note of occurrence in the province of Kristianstads, and analysis by Th. Nordström.

Kenngott, A. [Bole.] N. Jahrb. Heft ii. pp. 171, 172.

Finds that bole is not simply a silicate of alumina and peroxide of iron, but always contains lime.

Klein, Dr. **Carl**. Mineralogische Mittheilungen IV. N. Jahrb. Heft i. pp. 1–21, with plate.

This section of the series of papers is devoted to a purely physical investigation, relating to the optical properties of the Epidote recently found in the Lower Sulzbach valley. F. W. R.

——. [Wiserine from the Binnenthal.] N. Jahrb. Heft ix. pp. 961, 962.

Letter describing 4 types of anatase from the gneiss of the Alp Lercheltiny. The zircon-type has been described as Wiserine from the Binnenthal. F. W. R.

Klein, P. [Salts from Westeregeln.] N. Jahrb. Heft ix. p. 963.

Letter stating that the glauberite of Westeregeln in damp air or in water becomes coated with a white incrustation of minute crystals of gypsum. The carnallite when dissolved in water leaves an insoluble residue, consisting of gypsum, iron-glance, quartz, boracite, and probably rutile. F. W. R.

Klocke, F. Orthoklas von Schiltach. [Orthoclase from Schiltach.] Ber. naturf. Gesell. Freiburg, Bd. vi. Heft 4.

Fine crystals of orthoclase have been found in a granite-quarry on the old road from Schiltach to Schramberg, in the Black Forest. Both Baveno and Carlsbad twins occur. F. W. R.

Kobell, **Fr. von**. Ueber den Tschermakit, eine neue Mineralspecies aus der Gruppe der Feldspathe. [Tschermakite, a new species of the felspar-group.] Journ. prak. Chem., N. S. Bd. viii. pp. 411–414, and Amer. Journ. ser. 3, vol. vii. p. 239.

A mineral occurring with Kjerulfine, at Bamle, in Norway. Not crystallized, but cleaves with unequal facility in two directions, making an angle of 94°; the more perfect cleavage-plane finely striated. Analysis by Rhode leads to the formula, $3(RO.SiO_3)+Al_2O_3 . 2SiO_3$ or $3(RO.\frac{3}{2}SiO_2)+Al_2O_3 . 3SiO_2$. Protoxide-bases are magnesia and soda, with trace of potash;-no lime present. Named after Prof. Tschermak of Vienna. F. W. R.

——. Ueber Chrysotil, Antigorit und Marmolit, und ihre Beziehungen zu Olivin. [Relations of Chrysotile &c. to Olivine.]

Sitzungsb. math.-phys. Classe k. b. Ak. Wiss. Heft iii. pp. 165–176.

Analyses of Chrysotile from Zermatt, Antigorite from Zermatt, Vorhauserite from Monzoniberg, and a mineral from Kraubat in Styria. These belong to two allied species—*Serpentine*, with Antigorite and Chrysotile, and *Marmolite*, including Vorhauserite and the Kraubat mineral. The relations between the Serpentine and Marmolite are exhibited in graphic formulæ. F. W. R.

KOBELL, FR. VON. Les Minéraux: Guide Pratique pour leur Détermination &c. Paris.

A translation of the 10th German edition of Von Kobell's work, by Count de la Tour du Pin, intended for the use of chemists, manufacturers, &c., to assist in speedily recognizing and analyzing the principal minerals. C. E. DE R.

KOENEN, A. VON. Ueber einige neue Mineral-Vorkommnisse. Sitzungsb. Gesell. Beförd. ges. Naturwiss. Marburg, no. 5. [Noticed in N. Jahrb. 1875, p. 87.]

Describes occurrence of natrolite, phillipsite, and analcime in decomposing basalt at Stempel, near Marburg. Notes occurrence of brown spar at Bleialf Mine, near Call, in the Eifel. Gives analyses of the natrolite and of the brown spar. F. W. R.

KOKSCHAROW, N. VON. Resultate der an Aragonit-, Kupferkies- und Skorodit-Krystallen angestellten Messungen. Mél. Phys. Chim. t. ix. pp. 110–130, woodcut. (Bull. t. xix. pp. 558–572.)

Measurements of 7 crystals of aragonite from Bilin, in Bohemia; of copper-pyrites from the Victoria mine, near Müsen; and of scorodite from the Urals. F. W. R.

KOKSCHAROW, M. N. DE. Sur les Valeurs exactes des Angles et sur la Tétartoédrie des Cristaux de Fer titané. [On the exact values of the angles, and on the tetartohedrism of crystals of titaniferous iron.] Ann. Chim. Phys. sér. 5, t. iii. pp. 471–476, 2 woodcuts; also Compt. Rend. t. lxxix. pp. 734–738.

KÖNIG, G. A. Remarks on Silver Ore from Colorado. Proc. Ac. Nat. Sci. Philadel. p. 278.

The ore is composed of galena and antimoniferous ruby silver, and produces a crimson- and flesh-coloured incrustation when heated on charcoal at the point of the inner blowpipe-flame. A. H. G.

KONINCK, — DE (fils). [On specimens of Quartz and Barytine.] Ann. Soc. Géol, Belg. t. i. Bull. pp. lviii, lix.

Quartz from a chlophyre-pocket at Quenast; Barytine from Quenast.

KREJČÍ, J. Das isokline Krystallsystem. Pp. 52, with plate (crystals). 4to. Prague. Published in Abh. k. böh. Gesell. Wiss. for 1874.

A purely crystallographic paper on the isoclinic (rhombohedral) system.

Lasaulx, A. von. [Pseudomorphs &c.] N. Jahrb. Heft i. pp. 164–169.

Letter describing pseudomorphs of dolomite after calcite in tabular forms (∞ P.0P), from the Friedrich Mine, in the Stahlberg, near Müsen, and the occurrence of fibrous quartz in the same locality. F. W. R.

——. Ueber den Ardennit. N. Jahrb. Heft iii. pp. 276–278.

Reply to M. Pisani's criticism of the author's analysis of the new species *Ardennite* [*Dewalquite*]. Explains the discrepancy by assuming that arsenic acid replaces vanadic acid in different specimens of this mineral. F. W. R.

Laspeyres, H. [Iridescent quartz.] N. Jahrb. Heft i. pp. 49–61, Heft iii. pp. 261–265.

Letters on specimens of iridescent quartz from Oberstein. Laspeyres was led to their discovery by Vom Rath's description of an Indian specimen in the British Museum. F. W. R.

——. Amethyst-Zwillinge mit der trigonalen Pyramide $\frac{P2}{4}$ von Oberstein an der Nahe. Zeitsch. deutsch. geol. Ges. Bd. xxvi. Heft 2, pp. 327–341, with plate (crystals).

Specimen from a geode from Oberstein exhibited twins of amethyst made up of R.—R variously developed, rarely with ∞ R, very frequently with the pyramid P2, and in one case with a trigonal pyramid $\frac{P2}{4}$. F. W. R.

Lehmann, J. Ueber den Ettringit, ein neues Mineral, in Kalkeinschlüssen der Lava von Ettringen (Laacher Gebiet). N. Jahrb. Heft iii. pp. 273–275.

Ettringite is a new mineral from the neighbourhood of the Laacher See. It is a hydrous sulphate of alumina and lime, crystallizing in the hexagonal system, and occurring in limestone included in lava. F. W. R.

Lill, Max von. Polyhalit von Stebnik. Min. Mitt. Heft i. p. 89.

Analysis of polyhalite from salt-deposits of Stebnik, in Galicia.

Lindström, G. Blomstrandit, ett nytt uranmineral från Nohl. [Blomstrandite, a new uranium mineral from Nohl.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 162–164.

Analysis given and following formula—$RO(Nb_2O_5 . Ta_2O_5 . TiO_2) + 1\frac{1}{2}H_2O$.

Liversidge, Prof. A. Note on a new Mineral from New Caledonia. Journ. Chem. Soc. ser. 2, vol. xii. pp. 613–615.

This mineral occurs in veins traversing a serpentine rock near Noumea, the capital of New Caledonia. It is an amorphous soft substance, of fine apple-green colour, having a sp. grav. of 2·27. The analysis of this mineral, which is a hydrous silicate of nickel and magnesium, leads approximately to the formula $(NiO . MgO)_{10} . (SiO_2)_8 + 3H_2O$. Should it be desirable to apply a distinctive name to this substance, which is probably a product of decomposition, the author proposes to name it after its locality. [Subsequently this mineral was termed *Garnierite.*] F. W. R.

Loew, O. On Wheelerite, a new Fossil Resin. Amer. Journ. ser. 3, vol. vi. pp. 571, 572.

A yellowish resin found in thin layers in the Cretaceous lignite of New Mexico; it seems to have the formula C_5H_8O. Soluble in ether, less so in bisulphide of carbon; dissolved by potash, it is precipitated again by acids. Melts at 154° Cent. E. B. T.

Ludwig, E. Albit vom Schneeberg in Passevi. Min. Mitt. Heft ii. p. 176.

Analyses of the green albite enclosed in magnetic pyrites, from the Schneeberg in Passevi. The crystals are described by Rumpf (see p. 247). F. W. R.

——. Magnesiaglimmer von Pargas in Finland. Min. Mitt. Heft iii. pp. 239–241.

Analysis of a magnesia-mica from Pargas in Finland.

Lundström, C. H. Analyser å tvenne nya svenska mineraler. [Analyses of two new Swedish minerals.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 178, 179.

The minerals are *Korynite*, from Långbanshyttan mine in Wermland, formula $3RO . As_2O_5$; and a new sulphide of bismuth, lead, &c., from Nordmarken mine in Wermland, with formula $(FeS+2PbS)_3 BiS_3$. G. A. L.

Macivor, R. W. E. On native cupreous sulpharseniate. Chem. News, vol. xxx. no. 770, p. 103.

Gives an analysis of a specimen of *Dufrenoysite* from Switzerland, from which a formula may be deduced agreeing with that of enargite.

Martin, D. S. On the Rhombic Crystallization of Graphite. Proc. Lyc. Nat. Hist. N. York, ser. 2, no. 4, pp. 145, 146.

Abstract. Will probably appear in full in vol. xi. of the Annals of the Lyceum.

Maskelyne, Prof. N. S., and Dr. [W.] Flight. Mineralogical Notices. Journ. Chem. Soc. ser. 2, vol. xii. pp. 101–103.

A mineral from Leadhills, reputed to be *aurichalcite,* was found to resemble *Caledonite*, with which it also appeared to agree in crystallographic characters. Its analysis led to the following rational formula: $5PbSO_4+2PbH_2O_2+3CuH_2O_2$. As this composition differs from that assigned to Caledonite, an undoubted specimen of this mineral was analyzed; its analysis agreed substantially with that of the doubtful mineral. It appears, therefore, that Caledonite is not, as originally represented, a cupreous sulphato-carbonate of lead.

An analysis of a specimen of *Lanarkite* gave results represented by the formula $PbSO_4+PbO$. It contained neither water nor carbonic acid as an essential constituent. F. W. R.

Maskelyne, Prof. N. S., and Dr. W. Flight. On the character of the Diamantiferous rock of South Africa. Quart. Journ. Geol. Soc. vol. xxx. pp. 406–416, woodcut.

Contains analyses of bronzite, smaragdite, altered bronzite, and vaalite, from the South-African diamond-bearing rocks. *Vaalite* is a new species belonging to the vermiculite group, named from the Vaal river. The mineral is clinorhombic, with easy cleavage parallel to 001. Its formula is given as $R_2O_3 . SiO_2 + 2(3MgO . 2SiO_2 . 2H_2O)$. F. W. R.

Meehan, T. Description of a hollow cylinder of Carbonate of Lime showing concentric coats, which seemed to have been formed round a branch of a tree. Proc. Ac. Nat. Sci. Philadel. p. 266.

Meredith, Hon. C. On Tin-ore from Mount Bischoff, Tasmania. Monthly Notices Roy. Soc. Tasm. for 1873, pp. 21, 22.

The condition and appearance of certain specimens of the Mount-Bischoff tin-ore indicated that they had been obtained from a lode in place, in which they differed from the usual waterworn specimens of the Queensland and New-South-Wales tin-fields. R. E., Jun.

Mietzsch, Dr. H. Ueber die Farbe des Strichpulvers mancher Kohlen. [Colour of the powder of many of the Coals.] Verh. k.-k. geol. Reichs. pp. 364, 365.

Points out that many varieties of coal exhibit differences of colour when powdered, and that these differences do not correspond with differences of geological age. H. A. N.

Miller, W. H. On Quartz, Ice, and Karstenite. Phil. Mag. ser. 4, vol. xlvii. pp. 122–126.

Quartz: Crystallographic descriptions of two crystals from an unknown locality, each of which exhibits one face of a rhombohedron probably never observed before. The symbol of the new face is believed to be $50\ \overline{19}\ \overline{19}$. *Ice*: Experiments on the fracture of plates of ice show that they may be separated both parallel to the surfaces and normal to them, but that the separation is due to the existence of faces of union and not to true cleavage. *Karstenite*: Crystals traversing a cavity in the interior of a mass of Karstenite from Lüneberg exhibited, in addition to several of the forms observed by Hessenberg, faces of the following new forms—430, 150, 520, 530. F. W. R.

Müller, C. J. On some Black Crystals from Beachy Head. Papers Eastbourne Nat. Hist. Soc. 1873–74, p. 9.

These are small pointed crystals of carbonate of lime (Dog's-tooth spar), coating the ordinary colourless rhombohedral calcite found in the U. Greensand. Before the blowpipe they become white, showing the presence of carbon and the absence of metallic oxides. A microscopic examination of the black residue (after treatment with hydrochloric acid) showed small fragments of what the author regards as vegetable tissue, broken up and carbonized. The carbonaceous matter permeates the whole crystal. W. W.

Nauckhoff, G. Kopparhaltig Geokronit från Björkskogsnäs. [Cupriferous Geokronite from Björkskogsnäs.] Geol. fören. Stockholm Förhandl. bdt. i. p. 88.

Analysis as follows:—lead 57·95, copper 5·93, iron 0·11, antimony 17·33, sulphur 17·73; giving the formula $(Pb, 5Cu_2, Fe)S . SbS_3$.

——. Mineralogiska notiser från Filipstads bergslag. [Mineralogical notices from the Filipstad mining district.] Geol. fören. Stockholm Forhandl. bdt. i. pp. 166–168.

The minerals noted during a summer tour are:—aragonite, apophyllite, orthoclase, axinite, epidote, diopside (with analysis), manganophyll, titanite, crystallized magnetic iron-ore, native silver, and bismuth-glance. G. A.L.

Naumann, C. F. Elemente der Mineralogie. Ed. 9. 8vo. Leipzig.

Neminarz, E. F. Klinochlor von Chester Cty., Pennsylvania. Min. Mitt. Heft ii. pp. 176, 177.

Analysis of clinochlore from Chester Co., Pa.

——. Magnesiaglimmer von Penneville, Pennsylvania. Min. Mitt. Heft iii. pp. 241, 242.

Analysis of a magnesia-mica from Penneville, Pa.

Newberry, J. C. Laboratory Report of Analyses, Examinations, and Assays of Specimens from Mining Districts. Mineral Statistics of Victoria for 1873. No. 8. Melbourne.

Niederstadt, B. Estremadura-Phosphorit. Ber. deutsch. chem. Ges. pp. 107, 108.

Four analyses of phosphorite from Estremadura, Spain.

Nordenskiöld, A. E. Mineralier från Nohl, nära Kongelf. [Minerals from Nohl, near Kongelf.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 7–9.

The minerals mentioned are Epidote, Gadolinite (?), and *Nohlite.* Of the last an analysis is given.

——. Kristallografisk och kemisk undersökning af några fluormineralier från Ivituk i Grönland. [Crystallographical and chemical investigation of some fluor minerals from Ivituk, Greenland.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 81–88, 2 figs. in text.

The minerals described are *Ralstonite*, with analysis, and *Thomsenolite*, with analysis and figures of crystals.

——. Om Cacholong. K. Vet.-Akad. Förhandl. no. 5, pp. 3–6.

Analysis given, which gives to the mineral the formula $6(RO . SiO_2) + SiO_2$.

Nordström, Th. Sumpgasutveckling och fynd af bernsten vid en djupborrning i Skåne. [On development of marsh-gas and discovery of amber in a deep bore-hole in Scania.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 161, 162.

Onésime, le Frère. Note sur une variété nouvelle de fer oxydulé. [New variety of Magnetite.] Compt. Rend. 2 sess. Assoc. Franç. pp. 385, 386.

Description of a concretionary variety from St. Leon, in Sardinia.

Palmgren, L. Mineralogiska notiser från Södertörn. [Mineralogical notes from Södertörn.] Geol. fören. Stockholm Forhandl. bdt. i. 1872–74, pp. 188–192.

The following are the minerals noted—graphite, galena, nickeliferous pyrrhotine, calcite, serpentine, chondrodite, tourmaline, orthite, titanite, pyroxenic minerals (with analysis), rosite (with analysis), and kaolin (with analysis). G. A. L.

Parrau, —. Note sur les gîtes de fer oxydulé des environs de Cogne (Alpes du Piémont). [Deposits of Magnetite near Cogne, Piedmontese Alps.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 257, 258.

These deposits occur in lenticular masses in crystalline limestones, intercalated in a series of talcose schists of Laurentian age. The author has discovered three horizons of the ore. The deposits at Licone are the most important. The ore is associated with asbestos, green and black acicular amphibole, &c., and occasionally with brucite in thin veins or strings; noble serpentine is also met with. G. A. L.

Paykull, S. R. Rauit, ein neues Mineral von Brewig. Ber. deutsch. chem. Ges. pp. 1134, 1135.

Gives the name *Rauite* to a zeolitic mineral produced by the alteration of elæolite, on the island of Lamö, near Brevig, Norway. Analysis leads to the formula, $2\{Al_2O_3+(\frac{3}{4}CaO\frac{1}{4}Na_2O)SiO_2\}+5H_2O$. The name is derived from Rau, an old Norse goddess of the sea. F. W. R.

Petersen, Theodor. Zur Kenntniss der triklinen Feldspathe. Journ. prakt. Ch. Bd. ix. pp. 237–240, and N. Jahrb Heft iii. pp. 269–271.

Contains analyses of triclinic felspars from dolerite of the Frauenberg, near Heubach, and from basalt of the Steinbühl, near Weilburg. Both appear to be andesine; and the author argues in favour of the existence of this felspar as a distinct species. F. W. R.

Phillips, J. A. Elements of Metallurgy. A Practical Treatise on the Art of Extracting Metals from their Ores. 8vo. Lond. Pp. xx, 764.

Contains descriptions and analyses of ores.

Plympton, —. The Blowpipe. A guide to its use in the determination of salts and minerals. Pp. 167. 8vo. New York.

Popovits, A. Magnesiaglimmer von Ratnapura, Ceylon. Min. Mitt. Heft ii. p. 241.

Analysis of a magnesia-mica from Ratnapura.

Rammelsberg, C. Die Fortschritte der Mineralchemie wie sie seit fünfzig Jahren aus Poggendorff's Annalen sich ergaben. Pogg. Ann. Jubelband, pp. 381–407.

A review of the progress of mineral chemistry as set forth in Poggendorff's Annalen during the past fifty years.

——. Ueber die krystallographischen und chemischen Beziehung natürlicher Schwefel-Arsen- und Schwefelarsenverbindungen. Ber. deutsch. chem. Ges. pp. 152–156.

It is known that RS_2 is isomorphous with RAs_2; but R and As may themselves be isomorphous; therefore the compound RS_2 may be ismorphous with R_mAs_n. Hence the natural arsenides which contain sulphur may be referred to the general expression $RS_2 . xR_mAs_n$. If $x=1$, and $m:n=1:2$, we obtain the formula for arsenical pyrites, nickel-glance, and cobalt-glance. The natural compounds containing RS_2, or R_mAs_n, or isomorphous mixtures of these, form two heteromorphous classes of minerals, the one cubic and the other rhombic, which may be called respectively the pyrites and the marcasite group.
F. W. R.

Rath, G. vom. Mineralogische Mittheilungen. Pogg. Ann. Bd. clii. pp. 1–42, plate; and Amer. Journ. ser. 3, vol. viii. p. 319.

A continuation of the author's mineralogical communications. Contains the following essays:—Contribution to the knowledge of the crystallization and twin-formation of tridymite; a remarkable crystal of calc-spar from Lake Superior; a peculiar growth of rutile and iron-glance; artificial crystals of copper; hypersthene from Mont Dore, in Auvergne; and on Foresite, a new mineral of the zeolite family, from the granite veins of Elba. Also notes on andesine from trachyte of Ecuador; cordierite from Laach; and yellow augite from Vesuvius.
F. W. R.

——. Einige Studien über Quartz, Kupferkies, und Albit. Pogg. Ann. Jubelband, pp. 538–549, with part of a plate.

Describes a peculiar kind of twinning in amethyst; remarkable crystals of quartz from Madagascar; twins of copper-pyrites from Grünau on the Sieg; and crystals of albite in a volcanic rock. The albite occurs, with orthite, in fragments of trachyte in a conglomerate from the Langenberg in the Siebengebirge. F. W. R.

——. Ueber die chemische Zusammensetzung der Plagioklase (trikliner Feldspathe). [Chemical composition of plagioclase.] Monatsb. k. preuss. Ak. Wiss., Jan., pp. 26–32.

Analyses of plagioclastic felspars from the volcanic rocks of the Cordilleras of Ecuador. They include plagioclase from the quartz-andesite of Mojanda, from the andesite of Pululagua, and from the hornblende-andesite of Guagua-Pichincha and of Pomasqui. F. W. R.

——. Su la Foresite, nuovo minerale della famiglia dello Zeoliti rinvenuto nelle geodi tormalinifere dell' Isola d' Elba. [On Foresite, a new mineral of the Zeolite family found in tourmaliniferous geodes in the island of Elba.] Boll. R. Com. geol. Ital. pp. 237–242, and N. Jahrb. Heft iii. pp. 516–520.

This mineral, named after its discoverer, Signor Foresi, was found incrusting tourmaline and felspar in granite. It is nearest allied to desmine; its characters are:—Rhombic system, isomorphous with desmine. Sp. grav. 2·4. Contains 15 per cent. of water. Before the blowpipe it swells, becomes opaque and fuses; dissolves with difficulty in hydrochloric acid. Formula:—$\frac{1}{4}Na_2O \,.\, \frac{3}{4}CaO \,.\, 2Al_2O_3 \,.\, 6SiO_2 \,.\, 6H_2O$.
E. B. T.

Rath, G. vom. Wollastonit im Phonolith des Kaiserstuhl bei Freiburg im Breisgau. Graphit vom Korallenberge zwischen Endorf und Recklinghausen im obern Röhrthal, Westfalen. N. Jahrb. Heft v. pp. 521, 522.

Records occurrence of wollastonite in the phonolite of the Kaiserstuhl, near Freiburg i. B., and of graphite in Middle Devonian limestone in the valley of the Röhr, Westphalia. The graphite occurs in fissures of the limestone, and in investment-pseudomorphs on crystals of calcite.
F. W. R.

Reinwarth, C. Ueber den Stein- und Kali-Salzbergbau bei Westeregeln. [Mining for rock-salt and potash-salts near Westeregelr.] N. Jahrb. Heft vi. pp. 616–619.

Describes the deposits at Westeregeln, which are similar to those at Stassfurt, but contain a bed of *glauberite*, nearly 4 feet thick: polyhalite and tachyhydrite are absent. An analysis of the carnallite is given.
F. W. R.

Reusch, F. E., and G. Vom Rath. Ueber farbenschillernde Quarze vom Weisselberge bei Obernkirchen unweit St. Wendel. Pogg. Ann. Jubelband, pp. 532–538, with part of a plate.

Describes the peculiar play of colour exhibited by specimens of quartz from the melaphyre of the Weisselberg, near St. Wendel.

Reydellet, Dr. Sur la phosphorite de Belmez. Bull. Soc. Géol. France, 3 sér. t. i. pp. 350–352, 4 figs.

The author describes specimens of apatite from Belmez, in Spain, of a stalactiform and mammillated kind, which he collected from pockets in Carboniferous rocks. These specimens frequently enclose fragments of encrinites from the country-rock. In all the workings the deposits of apatite decrease downwards. The figures give plans and sections of the chief localities mentioned.
G. A. L.

Riviera, Marques de la. Estudio sobre las Turmalinas y descripcion de sus principales variedades. An. Soc. Españ. Hist. Nat. vol. iii. part 3.

Describes the different varieties of tourmalines, and illustrates his paper with two plates representing specimens from his collection, and the polarizing-properties of this mineral.
J. M'P.

Robert, Eug. Des stations celtiques au point de vue géologique.

[Celtic stations from a geological point of view.] Compt. Rend. t. lxxix. pp. 452–454.

Abstract. Discusses the origin of the various kinds of flints used by the first inhabitants of Gaul, whom he calls Celts.

Rose, G., and A. **Sadebeck**. Das mineralogische Museum der Universität Berlin. Pp. vi, 100. 8vo. Berlin.

The museum contains classified collections of (1) crystals, (2) minerals, (3) rocks, and (4) meteorites. Catalogues of these are given, with short notes. F. W. R.

Rumpf, Johann. Einfache Albitkrystalle aus dem Schneeberg in Passevi. Min. Mitt. Heft ii. pp. 97–101, with plate (crystals).

A specimen from the Schneeberg, in the Tyrolese Alps, exhibited an association of pyrrhotine, zinc-blende, and mica, the pyrrhotine enclosing prisms of a green mineral, which were found to be simple crystals of Albite. Analyses of the albite are given, and the crystals are described in detail. F. W. R.

——. Magnesiaglimmer von Morawitza. Min. Mitt. Heft ii. p. 177.

Analysis of an olive-green magnesia-mica, occurring with magnetite, near Morawitza, in the Banat.

——. Mispickel Krystalle von Schladming. Min. Mitt. Heft ii. p. 178.

Analysis of crystals of mispickel from Schladming.

——. Ueber Mispickel vom Leyerschlag in der Zinkwand bei Schladming. Min. Mitt. Heft iii. pp. 231–238, with plates (crystals).

Describes the crystals of mispickel occurring in the Zinkwand mine, near Schladming, in Styria, and notices the paragenesis of the minerals there. F. W. R.

——. Pinolit von Goldeck, u. s. w. Min. Mitt. Heft iv. pp. 281–284.

Describes (1) occurrence of pinolite at Goldeck, near Lend, in the Lower Pinzgau; (2) crinoid-remains from the pinolite-district at Sunk in Styria; and (3) halloysite from Tüffer. F. W. R.

Rutley, Frank. Mineralogy. Murby's Science and Art Department Series of text-books. Pp. x, 214; 68 figs. 8vo. Lond.

Part I. describes the chemical composition and physical properties of minerals, including a sketch of crystallography. Part II. describes the principal mineral species under the two groups of non-metallic and metallic minerals. Figures of crystals are given in plan and elevation, and the faces distinguished by a peculiar system of shading. F. W. R.

Sadebeck, Alexander. Ueber die Krystallisation des Bleiglanzes [Crystallization of Galena.] Zeitschr. deutsch. geol. Ges. Bd. xxvi. Heft 4, pp. 617–670, 3 plates (crystals).

Divided into three sections. The first, treating of crystal forms, de-

scribes both simple forms and twins. Two laws of twinning are recognized: in one the twin axis is a rhombohedral axis; in the other it is the symmetrical diagonal of a face of the icositetrahedron 808. Three types of galena-crystals are described—the regular, quadratic, and rhombohedral. The second section is on the "Krystallotektonik" of galena, in which the author discusses the formation of crystals by addition from without, and their irregularites of growth. The third section describes the modes in which the crystals become aggregated.
F. W. R.

Šafařík, Dr. A. Ueber die chemische Konstitution der natürlichen chlor- und fluorhaltigen Silikate. Pp. 33. 4to. Prague. With plate (graphic formulæ). Published in Abh. k. böh. Gesell. Wiss. for 1874.

Refers all natural silicates to the type $Si(OH)_4$, in which the tetratomic silicon is combined with four molecules of the monad radical hydroxyl. In those silicates which contain chlorine and fluorine, these monatomic elements appear to replace the group (OH). Discusses the chemical constitution of sodalite, microsommite, eudialyte, pyrosmalite, passauite, topaz, leucophane, chondrodite, apophyllite, and tourmaline.
F. W. R.

Sandberger, F. [Huantajayite.] N. Jahrb. Heft ii. pp. 172–174.

Letter giving results of scientific work at Würzburg during 1873, and including a notice of Raymondi's new species *Huantajayite*, a double chloride of sodium and silver, occurring in cubic crystals at Huantajaya in Southern Peru. F. W. R.

——. [Purple copper-ore, &c.] N. Jahrb. Heft vi. pp. 606–608.

Records occurrence, and gives analysis of purple copper-ore from near Wittichen, believed to be the only known occurrence of this mineral in the Black Forest. Also contains notes on titanic iron-ore from the Kaiserstuhl, Buchonite (a rock) from near Weiler, "asparagus-stone" from the Zillerthal, &c. F. W. R.

——. [Clarite.] N. Jahrb. Heft ix. p. 960.

Letter calling attention to new species from the Clara mine, in the Hinterrankach, to be called *Clarite*. A qualitative examination showed the presence of copper, antimony, arsenic, and sulphur. It appears to crystallize in the rhombic system. F. W. R.

Scharff [? Dr. F.] Ueber den Quarz. Die Uebergangsflächen. Pp. 42. 4to. Frankfurt a. M.

——. Weiteres über Sericit. N. Jahrb. Heft iii. pp. 271–273.

Describes occurrence of Sericite in the tunnel of Eppstein, and discusses whether this mineral is a definite species or not.

Scheerer, Th. Ueber die Bildung der erzbegleitenden Mineralien. [On the formation of minerals accompanying ores.] Pogg. Ann. Jubelband, pp. 314–321.

Calcite, barytes, fluor-spar, and quartz are the minerals which most commonly occur with ores in mineral veins. The mode in which each of these may have been deposited is discussed, and experiments on their formation are cited. Concludes that vein-fissures have been filled in by the wet way, and that the chief medium of solution has been water at various temperatures. Attention is directed to the influence of the temperature of a solution on the crystalline form of the deposited mineral. Experiments show that fluor-spar is deposited in cubes at a normal temperature, but in octahedra between 240° and 250° C. It is hence concluded that the tin-veins of the Erzgebirge, which carry octahedral fluor, were formed at a higher temperature than that which obtained during the filling-in of vein-fissures in the younger formations, where the fluor is cubic. F. W. R.

Schnorr, —. Studien an Mineralien von Zwickau. Programm der Realschule zu Zwickau für Ostern 1874. 4to. Pp. 17. [Noticed in N. Jahrb. Heft vi. p. 631.]

Notes on minerals occurring at Zwickau in Saxony, including several new occurrences. Describes calcite of Planitz and Grünau, blende from clay-ironstone, and calcite and quartz from cavities in amygdaloidal melaphyre. F. W. R.

Schrauf, Prof. A. Neues Mineral vom Banat. N. Jahrb. Heft vi. p. 608.

Veszelyite is a new phosphate of copper from the iron mine of Moravicza, near Bogschau, in the Banat. It forms crystalline crusts, of bluish-green colour, on a garnet rock. Its analysis leads to the formula $4\ CuO\ .\ P_2O_5+5H_2O$. The crystals are triclinic, with the following elements:—$a:b:c=0{\cdot}96529:1:0{\cdot}71516$. $\xi=92^\circ\ 1'$, $\eta=101^\circ\ 3'$, $\zeta=91^\circ\ 9'$. F. W. R.

——. Antimonit von Michelsberg. Min. Mitt. Heft i. p. 95.

Note on specimens of antimonite from a vein near Michelsberg, in Bohemia.

——. Cölestin vom Banat. Min. Mitt. Heft i. pp. 95, 96.

A specimen of celestine from Steierdorf, in the Banat, shows a very rare form of crystal—namely, Miller's faces *d* and *a*, and subordinately the pyramid *y* and doma *o*. F. W. R.

——. Monographie des Roselith. Min. Mitt. Heft ii. 137–160, with plate (crystals and projections).

Sketches the history of the rare species *Roselite*, notes its recent discovery at Schneeberg, discusses its chemical composition, and fully describes its crystalline forms. F. W. R.

——. Ueber Klinochlor, klinoquadratisches und klinohexagonales System. Min. Mitt. Heft ii. pp. 161–164.

As Nordenskiöld has suggested that Thomsenolite may be referred to a new division of the monoclinic system, which he calls the *clinoquadratic*, so Schrauf shows that clinochlore may be regarded as representing another subsystem, to be called the *clinohexagonal*. In all these sections the angles of the axes will be $\xi=\zeta=90°$, $\eta \gtrless 90°$ [*i. e.* two axes at right angles, and the third not]; and the parametric ratios in the general case are $b:a:c=m:1:n$; but in the clinohexagonal subsystem $b:a:c=\sqrt{3}:1:n$ [similar to Schrauf's orthohexagonal system, where $a:b=\sqrt{3}:1$], while in the clinoquadratic subsystem $b:a:c=1:1:n$ [*i. e.* two axes equal, the third not]. F. W. R.

Schrauf, Prof. A., and E. S. Dana. Notiz über die thermelektrischen Eigenschaften von Mineralvarietäten. [Thermo-electric properties of Mineral varieties.] Sitzungsb. k.-k. Ak. Wiss. math.-nat. Classe, Abth. 1, Bd. lxix. Heft 3, pp. 142–159, with a woodcut. Translated in Amer. Journ. ser. 3, vol. viii. pp. 255–267.

The results of many experiments are set down in tables, from which the following general results are to be gathered:—In the combination of sulphur with the negative metals Bi, Co, Ni, Pb, the character of these overcomes the influence of sulphur: a mixture of antimony weakens this negative character, but tellurium strengthens it. Among the combinations of iron the arsenides are negative, but most of the sulphides are positive. The authors have increased the number of minerals which vary in being sometimes positive, sometimes negative, by four species, viz. Tetradymite, Glaucodote, Skutterudite, and Arsenical pyrites. The change of signs in these cases can have nothing to do with right or left hemihedral crystallizations; and the cause is therefore supposed to be in all cases chemical composition; in the first three and some others the sp. gravity of the positive variety is less than that of the negative. E. B. T.

Schröder, Dr. H. Untersuchungen über die Volumconstitution einiger Mineralien. N. Jahrb. Heft iv. pp. 399-402, pp. 413, 414; Heft v. pp. 506-513; Heft vi. pp. 600–605; Heft vii. pp. 711–714; Heft viii. pp. 805–816; Heft ix. pp. 943–952.

Continuation of the author's researches on the volume-constitution of certain minerals.

Senft, Dr. Analytische Tabellen zur Bestimmung der Classen, Ordnungen, Gruppen, Sippen, und Arten der Mineralien und Gebirgsarten. [Tables for determination of minerals and rocks.] Pp. 102. 8vo. Hanover.

Siewert, Dr. Max. Ueber den Manganapatit und die Zusammensetzung des Apatits. Zeitsch. gesam. Nat. vol. x. n. ser. pp. 339–349.

Describes a mineral found at San Roque, near Cordoba, where it is associated with beryl. The new mineral was at first taken for chrysoberyl; but its analysis has shown that it is a variety of apatite, in which part of the lime is replaced by protoxide of manganese; the author therefore proposes to distinguish it as *Mangan-apatite*. [The formulæ given are evidently misprinted.] F. W. R.

SILLIMAN, Prof. B. Tellurium Ores of Colorado. Amer. Journ. ser. 3, vol. viii. pp. 25–29 (with a note on the geology of the region by A. R. MARVINE).

The tellurium veins are on the sides of a porphyry dyke cutting through metamorphic rocks at Gold Hill, near Denver City, and 8000 feet above the sea-level. Compared with the Transylvanian veins, the phenomena are here remarkable for their simplicity: the only ores noticed here are native tellurium, sylvanite, hessite, pyrites, zinc-blende, chalcopyrite, and rarely galena; in the European locality they are much more numerous. E. B. T.

——. Remarks on the Magnetites of Clifton, in St. Lawrence County, New York. Trans. Amer. Inst. Min. Eng. vol. i. pp. 364–371 (with discussion).

The magnetites occur in Laurentian rocks, and are associated with calcite, hornblende, garnet, copper-pyrites, and magnetic pyrites. Analyses of the ores are given. F. W. R.

——. On the probable existence of Microscopic Diamonds, with Zircons and Topaz, in the Sands of Hydraulic Washings in California. Trans. Amer. Inst. Min. Eng. vol. i. pp. 371–373.

Sands from workings at Cherokee, Butte Co., yielded hyacinths, topaz, quartz, chromic and titanic iron, with a few small masses supposed to be diamond. F. W. R.

SIPÖCZ, L. Plagioklas von Verespatak. Min. Mitt. Heft ii. p. 175.

Analysis of plagioclase from Verespatak in Transylvania. It is described as an isomorphous mixture of two molecules of albite and three of anorthite. F. W. R.

——. Zersetzter Plagioklas von Verespatak. Min. Mitt. Heft ii. pp. 175, 176.

Analysis of an altered plagioclase from the quartz-andesite of Verespatak.

SJÖGREN, A. Ett par nya fyndorter för mineralet Manganofyll. [New localities for Manganophyll.] Geol. fören. Stockholm Förhandl. bdt. i. p. 64.

In addition to the old locality (Pajsberg mine) two new localities, also in Wermland, are given, the Jacobsberg and Långban mines.

——. Kort lärobok i mineralogi för elementarläroverk. Andra upplagan. [Short text-book of mineralogy. Ed. 2.] Falun.

SKEY, W. On the mode of producing Auriferous Alloys by Wet Processes. Chem. News, vol. xxx. pp. 151, 152.

Concludes that native alloys of gold and silver have been deposited from alkaline solutions by the agency of metallic sulphides, such as iron-pyrites. F. W. R.

——. Critical Notes upon the alleged nuclear Action of Gold upon

Gold reduced from solution by organic matter. Chem. News, vol. xxx. pp. 162, 163.

It has been alleged that gold reduced from solution of its chloride by means of organic matter, such as wood, may be deposited around a nucleus of gold. Mr. Skey doubts this statement. He finds that the metal precipitated in this way assumes an incoherent form, and suggests that nuggets in the Drift have been formed by the reducing action of metallic sulphides, not of organic matter. F. W. R.

Skey, W. On the Formation of Gold Nuggets in Drifts. Chem. News, vol. xxx. pp. 172–174.

Suggests that the gold was originally disseminated through certain rocks, rather than in reefs; that sulphuretted hydrogen may attack the metal, producing a sulphide soluble in solutions of alkaline sulphides; and that this auriferous solution is ultimately reduced by metallic sulphides, such as iron-pyrites. The formation of gold nuggets may therefore be still going on in many of the Drifts. F. W. R.

Smith, C. The distribution of Spathic Iron Ore. Journ. Iron and Steel Inst. no. 1, pp. 157–165.

——. The Iron Ores of Sweden. Journ. Iron and Steel Inst. no. 2, pp. 310–319 (discussion, pp. 320–328); and Coll. Guard. vol. xxviii. p. 414.

The Swedish iron-ores are magnetite, red hæmatite, and brown hæmatite with some clay ironstone in the Skania coalfield.

The iron-ores are chiefly found in connexion with a felspathic rock peculiar to Sweden, "Helleflinta" (Leelite). The mines of Bispberg, Persberg, Grängesberg, Norberg, Nora, Schyssbyttan, and Taberg are described, with the mode of working the ores. G. A. L.

Smith, J. Lawrence. Warwickite. Amer. Journ. ser. 3, vol. viii. pp. 432–434; Compt. Rend. t. lxxix. pp. 696–698; Ann. Chim. sér. 5, t. iii. pp. 425–427.

Analyses of this mineral have hitherto been marred by impurities. Particles of spinel are in the rock and are very difficult to separate. By picking out under a lens, the sample obtained gave 20 per cent. of boracic acid: the silica and lime hitherto found are impurities. The formula proposed is $5MgO . 3BO_3 + (MgO . FeO) 2TiO_2$. E. B. T.

——. Curious Association of Garnet, Idocrase, and Datolite. Amer. Journ. ser. 3, vol. viii. pp. 434–436; Compt. Rend. t. lxxix. pp. 813, 814; Ann. Chim. sér. 5, t. iii. pp. 428–430.

The country-rock being calcite, these three minerals occur together. The idocrase does not exhibit its crystalline form, but permeates the crystals of garnet; a large crystal of garnet cut in two and polished shows the idocrase penetrating it like so many green streamlets. It came from Santa Clara, California. E. B. T.

——. El Corindo de Carolina Norte, Georgia y Montana. [Corundum of North Carolina &c.] Revista Minera, xxv. pp. 25–32.

A description of the occurrence of Corundum and its associated minerals in North Carolina, Georgia, and Montana, with a note on the existence of ruby and sapphire in N. Carolina and Montana. F. W. R.

SMITH, R. FRAZER. Zinc-Blende from an Antimony Mine. Chem. News, vol. xxx. p. 222.

Records the occurrence of zinc-blende with antimony-ore at Glendinning, Dumfriesshire. An analysis of the zinc-blende is given.

STOLBA, F. Aluminite from Kuchelbad. Chem. Centr. p. 135. [Noticed in Journ. Chem. Soc. ser. 2, vol. xii. p. 966.]

STRENG, Prof. A. Ueber einige in Blasenräumen der Basalte vorkommende Mineralien. N. Jahrb. Heft vi. pp. 561–586, with plate.

Describes several zeolitic minerals occurring in vesicular cavities in basalt. They include:—*Phillipsite* (Lime-harmotome) from the Limberger-Kopf near Buchholz, from Stempel near Marburg, from Annerod, Saasen, Nidda, &c.; *Apophyllite* from the Limberger Kopf; *Mesolite* from the same locality; *Faujasite* from near Annerod; and *Gismondine* from the Schiffenberg and Steinbach. F. W. R.

STROVER, Capt. G. A. Mineral Resources of Upper Burmah. Journ. App. Sci. vol. v. no. 50, pp. 26, 27.

Gold, silver, copper, iron, &c.

STRÜVER, G. Sulla Peridotite di Baldissero. Turin.

TANNER, ADOLF. Analys å titanjern från Egersund i Norge. [Analysis of titaniferous iron from Egersund, Norway.] Geol. fören. Stockholm Förhandl. bdt. ii, pp. 46, 47.

——. Om förekomsten af tungspat uti en jernmalmsfyndighet i Lena socken af Upsala län. [Occurrence of barytes in iron-ore in the parish of Lena, province of Upsala.] Geol. fören. Stockholm Förhandl. bdt. ii. p. 177.

TANNER, J. A. Examination for Indium of Smithsonite from South-western Virginia and Eastern Tennessee. Chem. News, vol. xxx. pp. 141, 142.

The mixed ore, of carbonate and silicate of zinc, worked in Wythe Co., Va., and in Leadvale, Tenn., was tested; the former gave but a very faint and doubtful indication, whilst the latter yielded the characteristic blue line *α*. F. W. R.

TIBERG, H. V. Spodiosit, nytt mineral fån Nyttsta Krangrufva i Vermland. [Spodiosite, a new mineral from Vermland.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 84–86, 1 fig. in text.

This mineral, which crystallizes in the rhombohedral system, is represented by the following formula:—

$$4Ca\,(F.Cl) + 5[Ca_3\,(PO_5\,.\,As_2O_5)].$$

A full analysis is given and figures of the crystalline forms.

G. A. L.

Tribolet, M. [F.] de. Sur la Saussurite et la Néphrite (Jadéite). Pp. 12. Published with Bull. Soc. Sci. Nat. Neuchâtel, t. x. 1 cahier.

Regards saussurite as a product of the alteration of anorthite. Shows that several distinct minerals are grouped together under the common name of nephrite, and distinguishes between true nephrite and Damour's jadeite; the former is a silicate of lime and magnesia, and is probably a compact variety of tremolite; the latter contains alumina up to 23 per cent., and stands near zoisite; an intermediate form occurs in New Zealand. Describes the mode of occurrence of nephrite in New Zealand and in the Kuenluen mountains. F. W. R.

Troost, Gerard. Manuscript Catalogue with minute descriptions of specimens in the late Dr. Ger. Troost's Mineralogical and Geological Cabinet. Amer. Journ. ser. 3, vol. viii. p. 319.

Note announcing the existence of the above.

Tschermak, G. Ludwigit, ein neues Mineral aus dem Banate. Min. Mitt. Heft i. pp. 59–66. Under different title in Verh. k.-k. geol. Reichs. p. 37.

Ludwigite is a new mineral from Morawitza in the Banat. It occurs as a dark green or black fibrous substance, which appears to be a molecular combination of borate of magnesia with proto-peroxide of iron. F. W. R.

——. Die Form und die Verwandlung des Labradorits von Verespatak. [Form and alteration of Labradorite.] Min. Mitt. Heft iv. pp. 269–278, 9 woodcuts (crystals).

Describes crystals of plagioclase in the quartz-andesite of Verespatak, in Transylvania. The crystals are always twinned, according to laws illustrated by the figures. They become altered to a kaolin-like substance, which consists mainly of a potash-mica with a hydrous silicate of alumina. Analyses are given of the pseudomorphs and of unaltered labradorite, from which it appears that the change consists chiefly in the replacement of soda by potash, the removal of lime, and the addition of water. F. W. R.

——. Neue Einsendungen an das k.-k. mineralogische Hof-Museum. [New contributions to the Imperial Geological Museum.] Verh. k.-k. geol. Reichs. pp. 86, 87.

Describes some new materials transmitted to the Geological Museum of Vienna. Also gives a fuller account of Ludwigite, noticed in a former communication. H. A. N.

T. [**Tschermak** ?] Eisennickelkies aus dem Sesia Thale. Min. Mitt. Heft iv. p. 285.

Describes occurrence of iron-nickel pyrites [Pentlandite] with magnetic pyrites, from the Sesia Thal, in Tyrol.

——. Potash-salt from East India. Rec. Geol. Surv. Ind. vol. vii.

pt. 2, p. 64 (translated from Jahrb. k.-k. geol. Reichs. xxiii. no. 2, p. 136).

A notice of specimens (exhibited by Dr. Oldham in the Vienna Exh.) of a mixture of sylvine (KCl) and kieserite ($MgSO_4$) from the Salt range of the Punjab. F. D.

Vála, Jos., and R. **Helmhacker**. Ueber Delvauxit. Arch. nat. Land. Böhm. Bd. xi. Abt. 2, Th. 1, p. 381. [Noticed in N. Jahrb. 1875, p. 317.]

Describes the occurrence of Delvauxite in Bohemia. The composition of the mineral, dried over chloride of calcium, is given as $2CaO.P_2O_5 + 5Fe_2O_3 . P_2O_5 + 16H_2O$, or as $CaO + 2Fe_2O_3 + P_2O_5 + 7H_2O$. F. W. R.

Vélain, Ch. Sur un feldspath orthoclase vitreux des pouzzolanes de l'île Rachgoün (Algérie, province d'Oran). [Vitreous orthoclase from the puzzolanas of Rachgoün Is.] Compt. Rend. t. lxxix. pp. 250–251.

This felspar is found in rounded tabular crystals with a rolled appearance, or oftener in rounded crystalline masses, disseminated in the midst of volcanic scoriæ and reddish puzzolanas, accompanied by crystals of pyroxene, having also a rolled aspect. This vitreous orthoclase has the peculiarity of being twice as rich in soda as in potash. An analysis is given. G. A. L.

Voelcker, Dr. A. Composition of a sample of Bordeaux Phosphate, Journ. Roy. Agric. Soc. ser. 2, vol. x. p. 283.

A detailed analysis is given; the sample contained 33·72 per cent. of phosphoric acid.

Websky, Prof. Ueber einige bemerkenswerthe Vorkommen des Quarzes. [Remarkable occurrences of quartz.] N. Jahrb. Heft ii. pp. 113–130, with plate (crystals).

Crystallographic description of remarkable specimens of quartz from Neuhaus, near Waldenburg, Silesia, from Oberstein on the Nahe, from Baveno, and from Traversella in Piedmont. F. W. R.

Weisbach, Prof. A. Notiz über den Roselith. N. Jahrb. Heft i. pp. 46–48.

Announces the recent discovery of the rare species *Roselite* at Schneeberg, in Saxony.

——. Luzonit. Min. Mitt. Heft iii. pp. 258, 259.

Describes, under the name of *Luzonite*, a mineral from the copper-veins at Mancayan, in the Isle of Luzon. It occurs chiefly as a compact, dark grey, metallic mineral, associated with enargite, and having a similar composition, an analysis leading to the formula Cu_3AsS_4. F. W. R.

Wibel, F. Ueber Guanovulit, ein neues Mineral in den Vogeleiern des Peru-Guanos. Ber. deutsch. chem. Ges. pp. 392–396.

Guanovulite is a crystalline body found in the remains of birds' eggs in Peruvian guano. Its analysis shows it to be a new species, having the following composition—$(H_4N)_2SO_4+2K_2SO_4+3KHSO_4+4aq.$ F. W. R.

Wichmann, A. Die Pseudomorphosen des Cordierits. Zeit. deutsch. geol. Ges. Bd. xxvi. Heft 5, pp. 675–701, with plate.

Studies of the microscopic structure of the following minerals, as products of the alteration of cordierite—chlorophyllite, praseolite, aspasiolite, gigantolite, hard fahlunite, pyrargillite, fahlunite (triclasite), and pinite. F. W. R.

Willcox, J. Corundum from Pennsylvania. Proc. Ac. Nat. Sci. Philadel. p. 266.

Specimen of corundum surrounded by chlorite, in which there seemed to have been an alteration of one of the minerals into the other. Crystals of corundum from S. Carolina, one partly, another wholly, converted into margarite. A. H. G.

——. New Mineral Localities in Canada not mentioned in Geol. Report on Canada or Dana's Mineralogy. Proc. Ac. Nat. Sci. Philadel. p. 276.

Winkler, Dr. Clemens. Rhagit und Roselith. Journ. prakt. Chem., N. S. Bd. x. pp. 190–192.

Rhagite is a new species, recognized by Weisbach, from the Weisser-Hirsch mine, near Schneeberg, in Saxony. It occurs in green botryoidal groups, whence the name. Its analysis leads to the formula $Bi_{10}As_4O_{25}+8H_2O$, or, dualistically, $5Bi_2O_3 . 2As_2O_5+8H_2O$. *Roselite*, a rare mineral of which only two species were previously known, has been found at the Daniel mine, near Schneeberg. Its composition may be represented by the formula $3RO . As_2O_5+H_2O$; where $R=Ca$, Mg, and Co. F. W. R.

Wleugel, Amanuensis. Analyse af Bergkork fra Mungafjeld. [Analysis of mountain-cork from Mungafjeld.] Forhandl. Vid.-Selsk. Aar 1873, Hefte ii. p. 488.

Wright, Dr. C. R. A. On Pyrites as a Source of Sulphur, Iron, and Copper. Journ. Soc. Arts, vol. xxii. no. 1119, pp. 536–547.

The different kinds of pyrites are described, and analyses of some are given. The greater part of the paper is a description of processes of extraction. W. W.

Wurtz, H. Streaks of Coals. Proc. Lyc. Nat. Hist. N. York, ser. 2, no. 4, p. 125.

Note suggesting the observation of the colour of the streaks made by different kinds of coal as a ready means of field-determination. Albertite gives the blackest streak; Grahamite a deep reddish- or maroon-coloured streak. G. A. L.

Zepharovich, M. V. Ritter von. Mineralogische Mittheilungen. V.

[Mineralogical communications, No. 5, with a plate.] Sitzungsb. k. Ak. Wiss., math.-nat. Cl. Abth. i. Bd. lxix. Heft 1, pp. 16–36.

Glauberite crystals and salt-pseudomorphs from Westeregeln, near Stassfurt, are first described. The glauberite is found in cavities in the clay with rock-salt at a depth of about 120 metres. The crystals are mostly tabular from the predominance of the face (001). The faces (334) and (445) are new. A table of observed and calculated angles is given. Gehlenite from Oravicza is next noticed; two analyses are given; magnetite and idocrase in microscopic crystals occur with it. The peripheral parts have been decomposed; and analyses of the resulting body shows that a mineral corresponding to Samoite of Prof. Dana is the result, containing about 29 p. c. of water. Silver, pseudomorphous after Stephanite, from Přibram is then shortly noticed. E. B. T.

Zepharovich, V. R. von. Mineralogische Notizen vom Hüttenberger Erzberge in Kärnthen. [Carinthian Minerals.] Lotos, Dec. 1874. [Noticed in N. Jahrb. 1875, p. 312.]

Describes the occurrence of linarite, bournonite, anglesite, and cerussite at the Hüttenberg Erzberg.

——. Ueber eine Feldspathmetamorphose von Čkyn in Böhmen. Min. Mitt. Heft i. pp. 7–12.

At Čkyn, in Bohemia, felspar is converted into a mineral which, on analysis, is seen to resemble pseudophite. The alteration is therefore similar to that at Plaben, near Budweis, described by Von Drasche. F. W. R.

Zerrenner, C. Wulfenit. Min. Mitt. Heft i. pp. 91, 92.

Gives three kinds of hemimorphism observed in the Wulfenite of Přibram. 1. Crystal is pyramidal at each end, but with P at one end and 2P′ at the other. 2. Crystal is short, with P at one end and drusy 0P at the other. 3. Crystal of ∞P . 2P, with drusy 0P at one end only. F. W. R.

——. Baryt. Min. Mitt. Heft i. pp. 92, 93.

Notes several physical peculiarities in crystals of barytes from Přibram—such as the fact that one face of $\breve{P}\infty$ often exhibits a greasy lustre, while another is vitreous. Also describes crystals in which a nucleus of one form is enclosed in a crystal of another. F. W. R.

——. Markasit nach Eugenglanz. Min. Mitt. Heft i. pp. 93, 94.

Corrects a previously published statement that pseudomorphs of iron-pyrites after polybasite occur at Přibram. The replacing mineral is marcasite. F. W. R.

——. Chalcedon von Trestyan. Min. Mitt. Heft i. p. 94.

A microscopic section of blue chalcedomy from Trestyan, in Transylvania, showed that the specimen was not a pseudomorph.

Zerrenner, C. Holzopal. Min. Mitt. Heft i. p. 94.
Note on specimens of wood-opal from Hungary, examined by Herr Schenk, of Leipzig.

——. Gediegen Kupfer. Min. Mitt. Heft i. p. 94.
Describes crystals of native copper from Tertiary quartz-conglomerate of Bolivia.

——. Adular. Min. Mitt. Heft i. p. 95.
Crystallographic notes on specimens of adularia in Dr. R. Ferber's collection at Gera.

See also the following:—

Cox, E. T. Analyses of coals and iron-ores, Indiana: p. 113.

Dawson, G. M. Analyses of lignites and ironstones, N. America: p. 115.

Harden, J. W. Analysis of iron-ore, S. Mountain (N. America): p. 117.

Harrington, J. Iron-ores, Canada: p. 128, under **Selwyn**.

Hoffmann, C. Analyses of coals, Nova Scotia, &c.: see **Selwyn**, p. 127.

Hughes, T. W. H. Analyses of coals, iron-ores, &c., India: pp. 134, 135.

Hunt, Dr. T. S. Analyses of coals and iron-ores, Hocking valley: p. 120.

Jones, Prof. T. R. Description of specimens from Griqualand West, in paper by **Stow**: p. 147.

Marvine, A. R., A. C. **Peale**, F. M. **Endlich**. Mineralogical notes and analysis of coals, Colorado: see **Hayden**, p. 118.

Milne. Mineralogy of Newfoundland: see Addenda.

Napier, J. Analyses of coals, S. Wales: see **Thomas**, p. 37.

Noth, J. Brown Coal, Limestone, and Graphite, Hungary: p. 86.

Schmidt, A., R. **Chauvenet**, &c. Analyses of ores and minerals, Missouri: see **Broadhead**, p. 111.

Stokes, A. H. Analysis of coals, Suderöe: p. 100.

Stoliczka, Dr. F. Jade in Turkestan: p. 141.

Willcox, J. Apatite in Laurentian rocks, Rideau Lake: p. 129.

MINERAL WATERS.

Anon. Ninth Annual Report on the Colonial Museum and Laboratory. New Zealand, 1874. Pp. 35.

Contains notes on several mineral waters in New Zealand, and an analysis of a spring in the Province of Napier.

Boussingault, —. Sur les eaux acides qui prennent naissance dans les volcans des Cordillères. [Acid waters derived from the volcanoes of the Andes.] Compt. Rend. t. lxxviii. pp. 453–461, 526–533, 593–599; and Ann. Ch. Phys. sér. 5, t. ii. pp. 76–130.

Carnelly, T. Analysis of one of the Trefriw Mineral Waters. Mem. Lit. and Phil. Soc. Manchester, vol. xiv. p. 59.

The spring, on the left bank of the Conway, issues at the rate of 40 gallons an hour; its temperature was 11° C., that of the air being 15°·5 C. on Sept. 8. From an analysis made in 1871 it appears that the quantity of iron is diminishing. Dr. Hayward states that the springs occur in Bala limestone, with alum-slate, iron-pyrites, and ironstone.

C. E. De R.

Fairley, T. Analysis of Water taken from the "Old Crescent Well," Harrogate, Nov. 14, 1873. Chem. News, vol. xxx. no. 774, p. 151.

Filhol, M. E. Note sur la composition chimique des eaux sulfureuses thermales des Pyrénées. [Sulphurous thermal waters of the Pyrenees.] Ann. Chim. Phys. sér. 5, t. iii. pp. 536–546.

Fresenius, Dr. R. Chemische Untersuchung der warmen Mineralquelle im Badhaus der Königlichen Wilhelmsheilanstalt zu Wiesbaden. Jahrb. Nassau. Ver. Nat. xxvii., xxviii. pp. 100–113.

Analysis of warm spring in the bath-house of the K. Wilhelmsheilanstalt at Wiesbaden.

——. Neue chemische Untersuchung des Kränchens, Fürstenbrunnens, Kesselbrunnens und der neuen Badequelle zu Bad Ems. Jahrb. Nassau. Ver. Nat. xxvii., xxviii. pp. 114–171.

Analyses of the mineral waters of the four above-named springs at Ems.

Gorceix, M. H. Étude des Fumerolles de Nisyros et de quelques-uns des Produits des Eruptions dont cette île a été le siége en 1872 et 1873. Ann. Chim. Phys. sér. 5, t. ii. pp. 333–354; Compt. Rend. t. lxxviii. pp. 1309–1311.

Gives composition of gases from the fumaroles, and analysis of hot saline water ejected. Refers the present eruption to penetration of sea-water into an old fissure extending from Nisyros to Hyali.

F. W. R.

Hayes, S. D. Waters of Prince-Edward Island, Nova Scotia. Chem. News, vol. xxx. no. 774, p. 154.

Partial analyses of the water of the city pump well, Charlottetown; of the Park spring; and of the Winter River, 6 miles from the city.

Laloy, —. Recherches géologiques et chimiques sur les eaux sulfureuses du Nord. [Geological and chemical researches on the sulphurous waters of the Département du Nord.] Lille.

——. Recherches géologiques et chimiques sur les eaux chlorurées du terrain houiller. [Geological and chemical researches on the waters of the Coal Measures.] Lille.

According to the author these waters are marine and have remained to the present time enclosed with the Coal Measures.

Lesseps, Ferdinand de. Sur les Lacs amers de l'Isthme de Suez. Ann. Chim. Phys. sér 5, t. iii. pp. 129–140; Compt. Rend. t. lxxviii. pp. 1754–1757.

Contains partial analyses of twenty-one samples of water from the Suez Canal, by M. Durand Clay.

Phillips, J. A. Note on the Composition of certain Mine Waters. Phil. Mag. ser. 4, vol. xlvii. pp. 164–167.

Analyses of water from the 212-fathom level at the Phœnix mines, Liskeard, and the 302-fathom level at Dolcoath, Camborne, which are believed to be *surface*-water that has taken up its solid contents during infiltration through the workings and through fissures.

A. H. G.

Schneider, F. C. Analyses of Thermal Springs, near La Battaglia, and of the Sulphur Springs of Trentschin-Teplitz. Chem. Centr. p. 122.

Sipöcz, L. Chemische Analyse einiger Wasser von Baden (in Wien). Min. Mitt. Heft iii. pp. 251–256.

Four analyses of waters from springs at Baden near Vienna.

Vlaanderen, Dr. C. L. Onderzoek van water uit Cheribon, in verband tot de voorgenomen, verbeterde drinkwatervoorziening van die hoofdplaats. Jaarb. Mijn. Nederl. Oost-Ind. Jaarg. 3, Deel 1, p. 180.

Analyses of waters from a pond at Selaganga, from the R. Tandjong, and from a spring at Toek, all in Cheribon, Java.

——. Onderzoek van het water van der artesischen put achter de Weeskamer te Batavia. Jaarb. Mijn. Nederl. Oost-Ind. Jaarg. 3, Deel 1, pp. 180, 181.

Analysis of water of an artesian well in Batavia.

Wreden, F., and A. **Fuchs**. Analysen von Mineralwassern und Salz aus Ciechocinek (Polen, Gouv. Warschau). Ber. deutsch. chem. Ges. pp. 1147–1150.

Analyses of the mineral waters of Ciechocinek, a popular bathing-place near Warsaw in Poland.

PALÆONTOLOGY.

1. *VERTEBRATA.*

Adams, Prof. A. **Leith**. On the Dentition and Osteology of the Maltese Fossil Elephants, being a description of remains discovered by the Author in Malta between the years 1860 and 1866. Trans. Zool. Soc. vol. ix. pt. 1, pp. 1–124, plates i.–xxii.

The ossiferous caves and fissures of Malta are enumerated. For geological details the author's 'Natural History and Archæology of the Nile Valley and Maltese Islands' (1870) may be consulted. The bones occur chiefly in clays and conglomerates with waterworn pebbles, and in most cases appear to have been transported by water to their present position. Hence they are scattered, fragmentary, and often much abraded. Some of the elephant-remains exhibit traces of gnawing. The author considers that the remains are divisible into two species, both allied to *Loxodon meridionalis*, viz. *Elephas mnaidriensis*, n. sp., and *E. melitensis*, to which latter *E. Falconeri* is, with some hesitation, referred, as a small variety. *E. mnaidriensis* attained a height of 6½–7 feet. Nearly the entire dentition and many bones are now known. The ridge-formula is:—Milk-Molars, 5 : 8 : 10–11; True Molars, 10–11 : 12 : 14–15. The crown-sculpture of the tooth allies this species to *E. antiquus*; most of the long bones show affinity with *Loxodon africanus*. *E. melitensis* had an average height of nearly 5 feet; the var. *Falconeri* is occasionally as low as 3 feet. The ridge-formula is:—Milk-Molars, 5 : 7 : 10–11; True Molars, 10–11 : 12 : 14. With these, bones and teeth of *Hippopotamus Pentlandi* and *H. minutus* occur, besides giant dormice and a large extinct Swan, which have not yet been found out of Malta. There are also undescribed bones of Reptiles. The details of the osteology and dentition are worked out, and illustrated by plates, mostly of natural size. L. C. M.

——. Concluding Report on the Maltese Fossil Elephants. Rep. Brit. Assoc. for 1873, pp. 185–187.

For the most part a summary of the foregoing. The evidence of the ossiferous caves and of the deposits containing remains of elephants leads the author to suppose that "the eastern basin of the Mediterranean had been at one time a common ground where all these extinct and living elephants met, and whence, with other animals, they have disappeared or been repelled to distant regions." L. C. M.

Agassiz, L. Three different modes of teething among Selachians. Amer. Nat. vol. viii. pp. 129–135.

Aitkin, J. Notes on the discovery of a new fish of the genus *Acrolepis*, Ag., in the Millstone Grit, near Hebden Bridge, Yorkshire. Trans. Manchester Geol. Soc. vol. xiii. pp. 36–47.

The scientific description is deferred.

——. On specimens of fish and teeth from Lancashire Coal-Measures. Trans. Manchester Geol. Soc. vol. xiii. part 7.

Two specimens of undescribed Ganoid Fish, of the genus *Pygopterus*, from Shale over Arley Mine, near Burnley. Palatal tooth of *Psephodus magnus*, from Arley Mine, near Burnley. Two specimens of *Petalodus*-teeth from Upper Foot-Coal, Oldham. L. C. M.

Baily, W. H. Palæontological Notes, in Memoir on sheet 47, Geol. Survey, Ireland: see under Egan, p. 10.

Barkas, W. J. *Hybodus*, a Coal-Measure Fish. Geol. Mag. dec. 2, vol. i. pp. 163–168 (woodcut).

Proposes to unite *Ctenacanthus* of the Carboniferous and all or part of *Cladodus* with *Hybodus*.

——. *Hybodus*, a Coal Measure Fish. Geol. Mag. dec. 2, vol. i. p. 287.

Notice of a reference, in Pictet's 'Traité de Paléontologie,' to two species from the Carboniferous formation described by Giebel.

——. *Amphicentrum* in a New Horizon. Geol. Mag. dec. 2, vol. i. pp. 431, 432.

A jaw from the Mountain Limestone of Richmond, Yorkshire.

——. List of Palæozoic Fishes. Geol. Mag. dec. 2, vol. i. pp. 542–553.

The list is edited and revised by Mr. Davies, of the British Museum. It gives under four headings an alphabetical list of genera and species. The authorities for the names and the stratigraphical distribution are noted. L. C. M.

Barrois, Ch. Vertébrés fossiles de la craie du Nord de la France. [Fossil Vertebrates of the Chalk of N. France.] Ann. Soc. Géol. Nord, 1870–74, pp. 42–44.

The list consists of 4 Reptiles and 44 Fishes (6 *Ganoids*; 27 *Placoids*, including two species of *Chimæra* hitherto known only as Jurassic, and *Myliobates*, only known before as a Tertiary genus; and 11 *Teleosteans*, including an undescribed species of *Beryx*). G. A. L.

Bayan, —. Sur les plumes d'oiseaux des gypses d'Aix. [Fossil feathers from the gypsum of Aix.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 386, 387.

M. Verreaux assigns seven specimens of feathers from the Marls of the Aix gypsum to the recent genera *Strix*, *Turdus*, *Sitta*, *Upupa*, *Alcedo*, and *Picus*. G. A. L.

Bianconi, G. G. Osservazioni addizionali intorno alla brevità del femore di *Æpyornis*. [The shortness of the femur of *Æpyornis*.] 4to. Bologna.

Blake, Rev. J. F. Additional remains of Pleistocene Mammals in Yorkshire. Rep. Brit. Assoc. for 1873, Sections, p. 75.

Records the discovery of various species of Mammalia (including *Elephas primigenius, E. antiquus, Rhinoceros*, &c.) in flint-gravel at Bielbecks, near North Cliff. All the associated shells are recent, and belong to river- or marsh-species. The deposit is believed to be Post-glacial. W. T.

Böttger, Oskar. *Spermophilus citillus*, var. *superciliosus*, Kp., ein riesiger fossiler Ziesel vom Bad Weilbach. [Gigantic fossil Marmot from Bad Weilbach.] Ber. Offenbach. Ver. Naturk. xiv. pp. 28–48, t. i.

A well-preserved skull and some other bones discovered. The other fossil species of *Spermophilus* are critically reviewed.

Botti, Ulderigo. Scoperta di ossa fossili nella Terra d'Otranto. [Discovery of fossil bones in the district of Otranto.] Boll. R. Com. Geol. Ital. pp. 242–244.

A cave on the sea-shore shows a mass of bone-breccia. Two elephant's molars were detached and brought away; the presence of *E. antiquus* is inferred. E. B. T.

Brandt, J. F. Ueber die bisher in Russland gefundenen Reste untergegangener Cetaceen. [Remains of extinct Cetacea hitherto discovered in Russia.] Bull. Ac. Imp. St. Pétersbourg, vol. xviii. p. 241.

Burden, Dr. **Henry**. On Fossil Teeth. Proc. Belfast Nat. Hist. and Phil. Soc. 1872–73, pp. 68–86.

The structure of the teeth of the various vertebrate classes is described; those of *Microlestes, Iguanodon, Labyrinthodon* [*Mastodonsaurus*], and *Carcharodon* are examined with more detail. L. C. M.

Busk, Prof. G. Notice of a Human Fibula of unusual form, discovered in the Victoria Cave, near Settle, in Yorkshire. Journ. Anthrop. Inst. vol. iii. pp. 392–395, with plate.

Description of a fragment of a fibula found in a deposit which has been regarded as of preglacial age. The great thickness and unusual form of the bone led at first to the suggestion that it might be elephantine. It has since been compared with a very similar human fibula. The bone appears to have been healthy and natural, and it is not likely that the corresponding tibia was platycnemic.
F. W. R.

Chantre, Ernest. Les faunes mammalogiques tertiaires et quaternaires du bassin du Rhône. [Tertiary and Quaternary mammals of the basin of the Rhone.] Compt. Rend. 2 sess. Assoc. Franç. pp. 403–409.

The type-faunas of which representative groups are to be found within this district are—*Quaternary*: Diluvium of the Seine and Alluvium and loams of the Rhine; Cave-deposits of the Jura and Pyrenees. *Passage-fauna*: Saint-Prest and Cromer. *Tertiary*: (Upper Pliocene)

Perrier and Norwich Crag; (Upper Miocene) Pikermi and Eppelsheim; (Middle Miocene) Simorre and sands of the Orleanais; (Lower Miocene) Indusial limestones of the Allier and marls of Ronzon, Gypsums of the Seine basin, Beauchamp sands. Full lists of localities given. G. A. L.

Chellonneix, E. *Ursus arctos* dans le diluvium de Beuvry. [*U. arctos* in the diluvium of Beuvry.] Ann. Soc. Géol. Nord, 1870–74, pp. 33–35.

Description of a nearly perfect specimen found in a sand-pit close to the Beuvry station in a pocket in eroded Landenian sands.

——. *Elephas primigenius* dans le diluvium de Sangatte. [*E. primigenius* in the diluvium of Sangatte.] Ann. Soc. Géol. Nord, 1870–74, pp. 38–40.

Cope, Prof. E. D. [On Fossils from Colorado.] Proc. Ac. Nat. Sci. Philadel. ser. 3, vol. iv. pp. 10, 11.

——. [Remarks on vertebrate remains and geological age of Cretaceous deposits of Colorado.] Proc. Ac. Nat. Sci. Philadel. ser. 3, vol. iv. pp. 12, 13.

——. Exhibition of Vertebrata from Miocene of Colorado. Proc. Ac. Nat. Philadel. ser. 3, vol. iv. pp. 89, 90.

——. [Skull of *Ctenodus*.] Proc. Ac. Nat. Sci. Philadel. ser. 3, vol. iv. pp. 91, 92.

The superficial cranial ossifications are described from specimens found in the Coal Measures of Ohio.

——. [Synopsis of palæontological investigations in Colorado.] Proc. Ac. Nat. Sci. Philadel. ser. 3, vol. iv. pp. 116, 117.

——. Notes on the Santa Fé Marls and some of the contained vertebrate fossils. Proc. Ac. Nat. Sci. Philadel. ser. 3, vol. iv. pp. 147–152.

The presence of *Hippotherium*, *Protohippus*, and other known genera determines the Pliocene age of these deposits. New species: ***Martes nambiamus***, *Cosoryx ramosus* (this genus is regarded as the ancestral type of the Cervidæ), *C. teres*, *Hesperomys loxodon*, ***Panolax sanctæ-fidei*** (new gen. of Rodentia), ***Cathartes umbrosus***. L. C. M.

——. On a new Mastodon and Rodent. Proc. Ac. Nat. Sci. Philadel. ser. 3, vol. iv. pp. 221–223.

Mastodon productus is described from the Pliocene sands of Santa Fé, and also *Steneofiber pansus*.

——. On the Characters of *Symborodon*. Proc. Ac. Nat. Sci. Philadel. ser. 3, vol. iv. p. 224.

——. On Dr. Leidy's "Correction." Proc. Ac. Nat. Sci. Philadel. ser. 3, vol. iv. pp. 224, 225.

See p. 274.

Cope, Prof. E. D. On some extinct types of horned Perissodactyles. Proc. Amer. Assoc. vol. xxii. B. pp. 108, 109.

The Miocene formation in W. America "embraced several genera and species of horned giants not very unlike the *Eobasilius* and *Uintatherium* in their armature." G. A. L.

——. Report on the Stratigraphy and Pliocene Vertebrate Palæontology of Northern Colorado. Bull. Geol. Surv. Territories, no. 1, pp. 1–28.

The age of the deposits has been determined by palæontological evidence solely. They lie between the South Platte river and the Lodge-Pole Creek. The Pliocene sandstone is believed to represent a swamp-formation. Beneath it is a bed of white friable argillaceous Miocene rock, probably of the White River epoch, several hundred feet thick; lower still a dark-coloured argillaceous rock apparently of freshwater origin, believed to be Cretaceous. "In the Pliocene strata above described, mammalian remains are exceedingly abundant over limited areas, those of horses in an especial manner . . . . . . The most important palæontological results are:—1, the discovery that the camels of this period possessed a full series of upper incisor teeth; 2, that the horses of the genus *Protohippus* are, like those of *Hippotherium*, three-toed; 3, that a Mastodon of the *M. ohioticus* type existed during the same period."

The following new species are described:—*Hippotherium paniense, Protohippus labrosus, P. sejunctus, Procamelus heterodontus, Merycodus gemmifer, Menotherium lemurinum, Hypertragulus tricostatus, Elotherium ramosum.* L. C. M.

——. Review of the Vertebrata of the Cretaceous Period found west of the Mississippi River. Bull. U.S. Geol. Surv. Territories, no. 2, pp. 1–77.

Messrs. Meek and Hayden had subdivided the Cretaceous beds of the West into:—1. The Dakota Group (Missouri River, Rio Grande, New Mexico). 2. The Benton Group (Missouri River, Smoky-Hill River, Kansas, Texas). 3. The Niobrara Group (Missouri River, Kansas, Texas). 4. The Pierre Group (Nebraska, Dakota, Middle Colorado), corresponding to the lower bed of Greensand of New Jersey. 5. The Fox-Hills Group (Dakota, Colorado), corresponding to the second bed of Greensand of New Jersey. The beds are enumerated in ascending order, and all are marine. Above them are found rocks of brackish or freshwater origin, comprising sandstones, shales, and lignites. 6. The Fort-Union or Lignite Group (from the Missouri valley to Colorado, passing under Tertiary beds by the way). 7. The Bitter-Creek Group (Wyoming). 8. The Bear-River Group (Wyoming River); perhaps contemporaneous with No. 7.

Very conflicting opinions are cited as to the age of the last three groups. They have usually been considered Tertiary. Professor Cope draws the line between Cretaceous and Tertiary at the top of No. 7.

"Below this line the formation must be accounted as Cretaceous, on account of the presence of the Dinosaurian *Agathaumas sylvestris*; and those above it, as I have already pointed out, Eocene, on account of the types of Mammalia contained in them." Dr. Hayden has regarded these beds as transitional between Cretaceous and Tertiary. Mr. Lesquereux regards them as Tertiary, on the ground of the type of their flora. There is no stratigraphical break or important change in mineral character between the undoubted Cretaceous and the undoubted Tertiary groups. Messrs. Lesquereux and Newberry have "pronounced this whole series of formations [the coal-bearing formations of the Rocky Mountains, from the lowest marine to the highest fresh-water beds] as of Tertiary age, and some of the beds to be as high as Miocene. The material on which this determination is based is abundant; and the latter must be accepted as demonstrated beyond all doubt. I regard the evidence derived from the mollusks in the lower beds, and the vertebrates in the higher, as equally conclusive that the beds are of Cretaceous age. There is, then, no alternative but to accept the result, that a Tertiary flora was contemporaneous with a Cretaceous fauna, establishing an uninterrupted succession of life across what is generally regarded as one of the greatest breaks in geological time. . . The circumstance of the discovery of a Mesozoic Dinosaur, *Agathaumas sylvestris*, with the cavities of and between his bones stuffed full of leaves of Eocene plants (Lesquereux), would prove this proposition to be true, had no other fossils of either kind ever been discovered elsewhere."

The following new species are described:—REPTILIA: *Clidastes planifrons, Sironectes anguliferus.* PISCES: *Pelecorapis varius, Portheus Mudgei, Ichthyodectes perniciosus, Pachyrhizodus leptopsis, Tetheodus* (new gen.) *pephredo, Enchodus petrosuo, Empo Merillii, E. contracta, Sporelodus* (new gen.) *Janevaii, Rhineastes pectinatus, Amyzon commune, Clupea theta.* L. C. M.

COPE, Prof. E. D. Report on Vertebrate Palæontology of Colorado. Ann. Rep. Geol. Surv. Territories for 1873. (See under HAYDEN, p. 118.)

The descriptions of extinct Vertebrata have previously appeared in Cope's Palæontological Bulletin, Nos. 14–17, and Bull. U.S. Geol. Surv. Territories, nos. 1, 2. See above.

COPE, Prof. E. D., — LE CONTE, &c. [Discussion on *Chelonia* and *Dinosauria* from Cretaceous deposits of Colorado.] Proc. Ac. Nat. Sci. Philadel. 3 ser. vol. iv. pp. 10, 11.

COX, Prof. E. T. *Colletosaurus Indianensis.* See p. 114.

DAWKINS, Prof. W. B. On the Northern Range of the Fallow Deer in Europe. Nature, vol. xi. p. 112.

Thinks that the Fallow Deer did not inhabit Northern and Central Europe in Pleistocene and Prehistoric ages, but believes that it was introduced into France by the Romans. C. E. DE R.

Dawkins, Prof. W. B. The Northern Range of the Basques. Mem. Lit. Phil. Soc. Manchester, vol. xiii. no. 8, p. 81.

In the Neolithic Caves of Gibraltar and the Spanish mainland are found skulls of a small long-headed race, with orthognathic profile, identical with the Basques, who ranged through the Peninsula, France, Britain, and Ireland, as far east as Belgium. C. E. De R.

Decock, —. Mâchoire d'un *Halocyon* dans la craie de Lezennes. [Jaw of *Halocyon* in the Lezennes Chalk.] Ann. Soc. Géol. Nord, 1870–74, p. 69.

Note of occurrence.

Defrance, G. A. Note sur un crâne de Morse (*Trichecus rosmarus*, L.) et autres débris fossiles trouvés dans un dépôt quaternaire, près de la ville de Sainte-Ménehould (Marne.) [Skull of the Walrus and other fossils from a Quaternary deposit near Ste. Ménehould.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 164–170.

Accepts the contemporaneity of the fossils. as against Prof. Gervais, who insists upon the more recent age of the *Trichecus* as compared with the Elephant, Rhinoceros, &c. G. A. L.

Delfortrie, M. Un *Zeuglodon* dans les Faluns du Sud-ouest de la France. [*Zeuglodon* from the Miocene, near Bordeaux.] Journ. Zool. vol. iii. pp. 25–30.

A tooth from the Upper Miocene of Saint Médard-en-Jalle, near Bordeaux, is described under the name *Zeuglodon vasconum*.

Filhol, M. H. Nouvelles observations sur les Mammifères des gisements de phosphates de chaux (Lémuriens et Pachylémuriens). [Mammals from the phosphate-of-lime deposits.] Ann. Sci. Géol. t. v. art. 4, pp. 1–36, plates 7, 8.

Proposes a new group, *Pachylemuridæ*, to include the *Palæolemur Betillei* from the phosphatic beds of Bedner (L. Miocene), *Adapis*, *Aphelotherium*, the genera of Lemurs recently described by Professors Cope and Marsh from the Miocene of the Western States, and a new fossil from St. Antonin, now described under the name of *Adapis magnus*. Another fossil Lemur (*Necrolemur antiquus*, n. sp.) from the same formation at Quercy is represented as allied to *Galago senegalensis* by its lower jaw and molar teeth, to *Lepilemur ruficaudatus* by its premolars, as well as by the structure of parts of the lower jaw, and to *Galago crassicaudatus* by the characters of the interorbital tract and of the sagittal crest. L. C. M.

Flower, W. H. On a newly discovered extinct ungulate mammal from Patagonia, *Homalodontotherium Cunninghami*. Phil. Trans. pp. 173–182, pl. xvi.

Derived from an ossiferous sandstone similar to that yielding *Nesodon*, probably older than the deposit in which *Macrauchenia* and *Toxodon* have been found. The maxillary alveolus with teeth and the mandible are the only parts identified. Other bones were got from the same matrix. The teeth have distinct crowns, and are decidedly hypsodont. In both jaws they form a perfectly unbroken series. *Homalodontotherium* seems to be "an extremely generalized type, related on the one hand to *Rhinoceros*, through *Hyracodon* also (though more remotely) to *Macrauchenia*, and apparently connecting these true perissodactyle forms with the more aberrant *Nesodon* and *Toxodon*." L. C. M.

FLOWER, W. H. Description of the Skull of a species of *Halitherium* (*H. Canhami*) from the Red Crag of Suffolk. Quart. Journ. Geol. Soc. vol. xxx. pp. 1–7, pl. i.

The skull had been broken along a vertical plane corresponding with the fronto-parietal suture, and the fore part, which alone is preserved, much worn. The fragment is larger than the corresponding part in recent Sirenia. It differs also in the strong division which exists between the orbit and the nasal fossa, in the apparently well-developed nasals, and in the dentition, which shows a more generalized condition than in them. The incisors are unknown. Among the Sirenia of Miocene and Pliocene age the present fossil comes nearest to *Halitherium Schinzi,* from which it differs in its superior size and massiveness, as well as in osteological details. The author remarks that "the discovery of a *Halitherium* allied to the species found in the neighbourhood of Darmstadt is an additional instance to those already recorded of the existence in our Crag of forms characteristic of the Miocene fauna of the Rhine valley." L. C. M.

FOOTE, R. B. *Rhinoceros deccanensis.* Palæontologia Indica, ser. x. 1, pp. 1–17, plates i.–iii.

This new species is represented by portions of a skull found in a lacustrine deposit of supposed Pleistocene age, near Gokak, Belgaum District. A bovine, allied to the recent *Bibos gaurus,* and a smaller but similar Rhinoceros have also been discovered in the same beds. *R. deccanensis* belongs to the hypsodont section; the incisors are absent or rudimentary; the mandibular symphysis is prolonged into a narrow beak-like projection; the first premolar is not persistent; and there is a well-developed guard in the molar series. A detailed comparison is made with all the recorded recent and fossil species. L. C. M.

FORSYTH-MAJOR, C. J. [Fossil *Lemuridæ.*] N. Jahrb. p. 67.

Thinks that *Lophiotherium Laharpii* (Palæontographica, Bd. xxii. t. vi. fig. 61) may be an extinct monkey, allied to the Lemurs.

——. "Sopra alcuni Rinoceronti fossili in Italia." [Fossil Rhinoceroses from Italy.] Boll. R. Com. geol. Ital. pp. 94–97, and Verh. k.-k. geol. Reichs. pp. 30–32.

Argues that the Rhinoceros from the Quaternary deposits of the neighbourhood of Rome and Arezzo is not *R. leptorhinus,* but *R. hemitœchus.* This latter is said to be a synonym of *R. Merckii,* Jaeger, which has priority. On the other hand *R. Merckii,* Meyer, is not Jaeger's species, but is identical with *R. etruscus.* E. B. T.

Gaudry, A. Sur l'*Anthracotherium* découvert à Saint-Menoux (Allier). [*A. Cuvieri*, Pomel.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 36–40, pl. ii.

——. Les races fossiles du Mont Léberon. [The fossil races of Mount Léberon.] Compt. Rend. 2 sess. Assoc. Franç. pp. 39–43, pl. i.

A comparison between the mammalian remains of this locality (Department of Vaucluse) with those of Pickermi, to illustrate the author's views on evolution. G. A. L.

——. *Lestodon trigonidens* et *Valgipes deformis*. Journ. Zool. vol. iii. pp. 161–164, pl. v.

A part of a lower jaw with one tooth, from the "Terrain pampéen" of the Argentine Republic, and a calcaneum from one of the bone-caves of Brazil, are believed to indicate two unknown genera of Tardigrade Edentates, and are named as above. The second, although resembling the calcaneum of *Scelidotherium*, is said to indicate a much larger animal. E. T. N.

——. Mammifères nouvellement découverts dans les Chaux phosphatées. [New Mammals from the Phosphate deposits.] Journ. Zool. vol. iii. pp. 286, 287.

The lower jaw of a small mammal resembling *Xiphodon* has been discovered in these deposits: it is said to have affinities with both *Anoplotherium* and *Anthracotherium*; and a new genus and species are established to receive it, viz. *Tragulohyus inermis*. Doubts are thrown upon the presence of *Tapirulus hyracinus* in these beds. Remains of *Lophiotherium cervulum* have been found, and also parts of a small mammal provisionally called *Anoplotherium secundarium*. E. T. N.

——. Forme typique des Membres chez les Equidés. [Typical form of the Limbs in the Equidæ.] Journ. Zool. vol. iii. pp. 300–307.

Compares the bones of the fore and hind limbs of the horse, more especially those of the feet, with the homologous parts in the *Hipparion*, *Palæotherium*, *Anchitherium*, *Anchilophus*, *Orohippus*, and *Daman*, to show that the single digit of the horse is homologous with the third or middle digit of the pentadactyle foot. E. T. N.

——. Présence du genre Lépisostée parmi les fossiles du bassin de Paris. [*Lepidosteus* among Paris-Basin fossils.] Journ. Zool. vol. iii. pp. 457–461, and Compt. Rend. t. lxxix. pp. 844–846.

Lepidotus Maximiliani, Ag., has been compared with specimens recently acquired, which show the vertebræ to be opisthocœlous. The author assigns them to *Lepidosteus suessionensis*. E. T. N.

Günther, A. Description of the Living and Extinct Races of Gigantic Land-Tortoises. Pts. i. ii. Introduction, and the

Tortoises of the Galapagos Islands. Proc. Roy. Soc. vol. xxii. pp. 421, 422 (abstract).

Haast, Dr. Julius. On *Harpagornis*, an Extinct Genus of Gigantic Raptorial Birds of New Zealand. Trans. N. Zealand Inst. vi. pp. 62–75, pls. 7–9.

The first remains of this gigantic bird of prey were found in turbary deposits at Glenmark, and consisted of a left femur, two ungual phalanges, and a rib, belonging to the same individual. A second discovery at the same locality, 6 or 7 feet below the surface, and mixed with pieces of drift-timber and moa-bones, consisted of various limb-bones. A fragmentary humerus was obtained from the banks of the Glenmark Creek, which consist of Postpliocene alluvium in the form of large shingle-beds interstratified with sand and turbary deposits; these remains are described under the name of *Harpagornis Moorei*. A third discovery, near the same locality, showed the existence of a smaller raptorial bird (*H. assimilis*), closely allied to the former species; perhaps indeed the difference is only sexual. The various bones are described at length. R. E., Jun.

——. President's Address (1874), Phil. Inst. Canterbury. Trans. N. Zealand Inst. vi. pp. 419.

Former opinions respecting the fluviatile formation of the Canterbury Plains are again advanced in opposition to views put forth by Captain Hutton as to their marine origin. Proposes a scheme for the classification of the Struthious birds from the turbary deposits of Glenmark, and believes that the presence or absence of the back toe (*hallux*) is a good mark of generic distinction. The following is a brief outline of Dr. Haast's arrangement:—A. Fam. *Dinornithidæ*. a. *Dinornis* (*D. maximus*, *D. robustus*, *D. ingens*, *D. struthioides*, and *D. gracilis*); b. *Meionornis*, Haast (*M. casuarinus* and *M. didiformis*). B. Fam. *Palapterygidæ*: a. *Palapteryx* (*P. elephantopus* and *P. crassus*); b. *Euryapteryx* (*E. gravis* and *E. rheides*). R. E., Jun.

Hawkins, Prof. B. W. On the Pelvis of *Hadrosaurus*. Proc. Ac. Nat. Sci. Philadel. 3 ser. vol. iv. pp. 90, 91.

Hector, Dr. J. On *Cnemiornis calcitrans*, Owen, showing its affinity to the Lamellirostrate Natatores. Trans. N. Zealand Inst. vi. pp. 76–84, pls. 10–14*a*.

The larger portion of a skeleton was obtained from the Earnscleugh Cave, Otago. The skull and sternum indicate that it belongs to the Lamellirostrate Natatores, that the power of flight was obsolete, and that it was probably allied to the Australian *Cereopsis*. In the short lofty head, solid palate, and the peculiar character of the tympanic cavity *Cnemiornis* differs from the majority of the duck tribe. The lower extremities are remarkable for their massive development.

Cnemiornis was widely spread over the New-Zealand islands. The bones of the skeleton are described at length, and a table of admeasurements given. R. E. Jun.

Hector, Dr. J. On the Fossil Reptilia of New Zealand. Trans. N. Zealand Inst. vi. pp. 333–358, pls. 28–31.

Parts of no less than 43 individual reptiles, "mostly of gigantic size and all of aquatic habits, and belonging to at least thirteen distinct species, have been discovered." The stratigraphical position of these and accompanying fossils has been determined to be about that of the European Cretaceous period. The following is a synopsis of the species:—A. Vertebræ flat or slightly biconcave. 1. *Plesiosaurus*: *P. australis*, *P. crassicostatus*, *P. Hoodii*, *P. Holmesii*, *P. Traversii*, *P. Mackayii*. 2. *Polycotylus*, Cope: *P. tenuis*. 3. *Mauisaurus*, Hector: *M. Haastii*, *M. latibrachialis*. B. Vertebræ procœlian; swimming-paddles. 4. *Leiodon*: *L. Haumuriensis*. 5. *Taniwhasaurus*, Hector: *T. Oweni*. The *Ichthyosaurus* is only represented by a single vertebral centrum (*I. australis*) from Mount Potts, Province of Canterbury.

Dr. Hector considers that the Amuri-Bluff section "includes a lower formation than yet found in the Waiparia district, and that this lower group can be distinguished by its included fossils." R. E., Jun.

Honeyman, D. Skeleton of a Whale in the Quaternary of New Brunswick. Am. Journ. ser 3, vol. vii. p. 597.

Beluga vermontana (?) in a clay of the Champlain period, at Jacquet River, Dalhousie, New Brunswick.

Horne, W. On the occurrence in the Yoredale Rocks of Wensleydale of Fish and Amphibian Remains. Rep. Brit. Assoc. for 1873, Sections, p. 84.

The remains occurred in thin limestones above and contiguous to the main limestone. Among them were teeth of *Cladodus* and *Pleurodus*, and bones of the limbs of a Labyrinthodont amphibian. W. T.

Hovey, Edmund O. The largest Fossil Elephant Tooth yet described. Proc. Amer. Assoc. vol. xxii. B. p. 112 (abstract).

Tooth found in Alameda Co., California. Vertical depth 13 inches, transverse measurement 15 inches, length of triturating surface 9 inches. Weight 21½ lbs. G. A. L.

Hulke, J. W. Note on a very large Saurian Limb-bone adapted for progression upon Land, from the Kimmeridge Clay of Weymouth, Dorset. Quart. Journ. Geol. Soc. vol. xxx. pp. 16, 17, pl. ii.

Regards this as a left humerus, referable provisionally to *Ceteosaurus*. The posterior border has a rounded edge, while the anterior border, especially towards the distal end of the bone, has the form of a thin, rough, and very prominent crest. For this fossil the specific name *C. humero-cristatus* is proposed. L. C. M.

Hulke, J. W. Supplemental Note on the Anatomy of *Hypsilophodon Foxii*. Quart. Journ. Geol. Soc. vol. xxx. pp. 18–23, pl. iii.

Further details are given respecting the structure of the skull and of the vertebral column. The palatals and pterygoids are described. The sacrum is contrasted with that of *Iguanodon Mantelli*. The writer maintains the generic distinctness of *Hypsilophodon*. L. C. M.

——. Note on an Astragalus of *Iguanodon Mantelli*. Quart. Journ. Geol. Soc. vol. xxx. pp. 24–26, figs. 1–4.

In all recent and fossil reptiles, except *Dinosauria*, which have a foot capable of flexion and extension, the hinge occurs at the junction of the leg with the astragalus. In birds the movable joint is beyond the astragalus, but, except in some of the *Ratitæ*, the astragalus unites with the tibia at an early age. In *Dinosauria* the joint is situate as in birds, but the astragalus remains distinct throughout life. The present fossil shows its persistence as a separate bone in *Iguanodon*, and also its immobility with respect to the tibia. L. C. M.

——. Note on a Reptilian Tibia and Humerus (probably of *Hylæosaurus*) from the Wealden Formation in the Isle of Wight. Quart. Journ. Geol. Soc. vol. xxx. pp. 516–520, pl. xxxi.

Observes that if his determinations prove correct, the great reduction of fore limbs in *Iguanodon* and *Megalosaurus* does not hold in *Hylæosaurus*. L. C. M.

——. Note on a modified form of Dinosaurian Ilium, hitherto reputed Scapula. Quart. Journ. Geol. Soc. vol. xxx. pp. 521–528, pl. xxxii.

Two new examples are described and figured, while a third is noticed. The reference of similar bones to the shoulder-girdle of Dinosauria is controverted. No evidence of junction with sacral vertebræ has offered itself. The author thinks that the attachment of the ilium to the vertebral column may have been fibrous. L. C. M.

Johnson, Randall. Notice of a new Species of Deer from the Norfolk Forest-bed. Ann. Nat. Hist. ser. 4, vol. xiii. pp. 1–4, pl. i.

A large part of a palmated left antler with a part of the skull attached, obtained from the Forest-bed at Hasbro. The author considers it allied to *Cervus megaceros*, and, on account of the great width of the frontal bones, proposes to name it *C. latifrons*. A list of the Cervidæ of the Forest-bed is given. E. T. N.

Jeitteles, L. H. Ueber die geographische Verbreitung des Damhirsches in der Vorzeit und Gegenwart. [Geographical distribution of the Fallow-deer in the past and present.] Zool. Garten, August. Translated in Nature, vol. xi. p. 71.

The Fallow-deer is stated to have had a wide European range in prehistoric times, and to have inhabited Lebanon and England. In historic times it has occurred in Egypt and Assyria. It is now found wild in Asia Minor, North Africa, Sardinia, probably in Spain, in Greece, the Cevennes, and the Alps of Dauphiné. L. C. M.

KNIGHT, C. On the Teeth of *Leiodon*. Trans. N. Zealand Inst. vi. pp. 358–362, plates 24–26.

The mandible of *Leiodon* is composed of four bones, viz. dentary, coronoid, angular, and splenial or opercular, and is Lacertian in character. The crown of the tooth has a simple conical form, and is polished, striated, and of a dark colour. The fang is tapering and subventricose in form. The teeth are Acrodont, and allied in this character to the *Mosasaurus*. R. E., Jun.

KOWALEVSKY, Dr. W. Osteologie des Genus *Anthracotherium*. Palæontographica, Bd. xxii. 5te Lief. pp. 291–346, with 5 plates.

The third instalment of a monograph on *Anthracotherium* and its allies, the letterpress referring to this genus alone. The examples illustrated are chiefly those from the Molasse of Rochette, near Lausanne and Bumbach. Of the limbs and extremities most of the bones have been found; upper and lower jaws from Rochette are drawn; but the skull has not been found uncrushed. A restoration of *A. valdense* is given. E. B. T.

——. On the Osteology of the *Hyopotamidæ*. Phil. Trans. vol. 163, pt. 1, pp. 19–94, plates xxxv.–xl.

Contains a detailed description of the long bones and the limbs. Some crania and teeth are figured, but without express description. The general organization of the family *Hyopotamidæ* is discussed; and the author seeks to throw light on the derivation of the existing ungulate types. *Anoplotherium* has hitherto been regarded as a primitive form or common ancestor of the Paridigitate (Artiodactyle) Ungulata. This position has been assigned to it partly owing to its antiquity among fossil Ungulates, but chiefly because it was fully described by Cuvier, while no adequate account of its fossil allies was accessible. The author considers *Anoplotherium* the last remnant of a dying-out branch, not as the progenitor of the varied Paridigitata of the Miocene and Pliocene epochs. The feet of this genus are so much reduced, presenting only two developed digits, that it is impossible to suppose it the ancestor of the whole group of Miocene, Pliocene, and recent Paridigitates, many of which have four functional toes. Moreover *Anoplotherium*, like forms on the verge of extinction, is exceedingly poor in specific forms. The *Hyopotamidæ*, on the contrary, are rich in subgeneric and specific forms. The family contains both didactyle and tetradactyle genera, and ranges back to the Eocene period. Palæontology does not reveal the common ancestor of both Paridigitata (Artiodactyla) and Imparidigitata (Perissodactyla), which may be conjectured to have been a pentadactyle ungulate, possibly of L. Cretaceous age. The author proposes to separate the didactyle form (found at Hordwell) from *Hyopotamus*, and to found thereon the new genus *Diplopus*. The carpal, tarsal, metacarpal, and metatarsal bones of the fossil and recent Ungulates are considered at length; and the author believes that these parts of the skeleton offer the clearest indication of the derivation of all Ungulata from a common stock, and of the manner of their divergence. New species, *Diplopus Aymardi*. L. C. M.

Krefft, G. On the further discovery of Remains of a Great Extinct Wingless Bird in Australia. Geol. Mag. dec. 2, vol. i. p. 46.

The bones were found in alluvium, on the Black Lead, Gulgang, imbedded in brown dust at a depth of 160 feet from the surface. They consisted chiefly of fragments of vertebræ, and indicated a bird rather more strongly built than the Australian Emu, but not larger. In the matrix containing the remains of *Diprotodon* and *Thylacoleo* at Wellington, New S. Wales, Mr. Krefft obtained the fractured crown of a human molar, which may perhaps lead to the conclusion that man was contemporary with these extinct Marsupials. Some new *Diprotodon*-remains from Gomrie Creek, Darling Downs, indicate that the inflected angle of the jaw resembles that of the Phalangers, and was not as deep as that of the Wombats. R. E., Jun.

Lankester, E. R. Magister Schmidt on the shields of *Pteraspis* and *Scaphaspis*. Geol. Mag. dec. 2, vol. i. p. 288,

A reply to letters in the Geol. Mag. for 1873. The generic distinctness of *Scaphaspis* is affirmed.

Lejeune, —. Molaire d'éléphant trouvée à Audingues. [Elephant's molar found at Audingues.] Ann. Soc. Géol. Nord, 1870–1874, p. 17.

Note of occurrence.

Leidy, Prof. [Correction of statements by Prof. Cope.] Proc. Ac. Nat. Sci. Philadel. 3 ser. vol. iv. pp. 74, 75.

——. Notice of Remains of *Titanotherium*. Proc. Ac. Nat. Sci. Philadel. 3 ser. vol. iv. pp. 165, 166.

Suspects that *Mecacerops coloradensis*, *Brontotherium*, *Symborodon*, and *Miobasileus* are all referable to *Titanotherium*.

——. Remarks on Fossils presented. Proc. Ac. Nat. Sci. Philadel. 3 ser. vol. iv. pp. 223, 224.

Titanotherium and *Stylemys* from Tertiary of Nebraska &c.

——. Notice of donation of Fossils &c. from Wyoming. Proc. Ac. Nat. Sci. Philadel. 3 ser. vol. iv. pp. 267, 268.

Trionyx uintaensis is described, and other chelonian remains noted.

——. Remarks on Fossils from Wyoming. Proc. Ac. Nat. Sci. Philadel. 3 ser. vol. iv. p. 277.

New species:—*Palæosyops junior*, *Uintacyon edax*, *U. vorax*, *Chamæleo pristinus*.

Leidy, Prof. Remarks on Fossil Elephant Teeth. Proc. Ac. Nat. Sci. Philadel. 3 ser. vol. iv. pp. 416, 417.

Lundgren, B. [Carboniferous Fishes from Schonen.] N. Jahrb. p. 404.

The occurrence of fossils supposed to resemble *Gyrolepis* and *Palæoniscus* is noted.

McCoy, Prof. F. *Phascolomys Pliocenus*. See Invertebrata, *post*.

Marsh, Prof. O. C. Notice of New Tertiary Mammals. Amer. Journ. ser. 3, vol. vii. pp. 531–534.

New species of *Edentata*, the first found in the Tertiary formation: *Morotherium gigas* (Pliocene, California); *M. leptonyx* (Pliocene) is a smaller species; *Stylinodon mirus* (U. Eocene of Wyoming), *Tillotherium latidens* (U. Eocene of Wyoming), *Elotherium bathrodon* (Miocene of Dakota). E. B. T.

——. On the Structure and Affinities of the *Brontotheridæ*. Amer. Nat. vol. viii. pp. 79–85, pls. i. & ii.; and Amer. Journ. ser. 3, vol. vii. pp. 81–86.

Contains an account of the general characters of the *Brontotheridæ* and a description of *Brontotherium ingens*, the largest of the group. This family is distinguished from the *Rhinocerotidæ* by having four toes in the manus, and three in the pes, and also in having a pair of horn-cores placed transversely. It differs from the Eocene *Dinocerata* in having but a single pair of horn-cores, in having small canines and large molars (the reverse of which obtains in *Dinocerata*) in having one toe less on each foot, and in some other particulars. The *Brontotheridæ*, which form a distinct family of the Perissodactyla, with some affinities to the Proboscidea, have been obtained from the Miocene beds of Dakota, Nebraska, Wyoming, and Colorado. E. T. N.

Marshall, W. [Skulls from the Peat of the Isle of Ely.] Journ. Anthrop. Inst. vol. iii. pp. 497, 498.

A brachycephalic skull found in peat. Measurements are given. Associated with it was the calvarium of another skull, evidently dolichocephalic. F. W. R.

Martin, Prof. D. S. On *Odontopteryx toliapicus*, Owen. Proc. Lyc. Nat. Hist. N. York, ser. 2, no. 4, pp. 97, 98

Denies that this form manifests "a transitional character to the Pterosaurian order."

Martin, K. Petrefacten aus der raethischen Stufe bei Hildersheim. [Rhætic fossils from Hildersheim.] Zeitsch. deutsch. geol. Gesell. Bd. xxvi. Heft 4, pp. 816–820, part of plate.

Describes fishes from Rhætic beds. Two are new species, named *Pholidophorus Roemeri* and *Hybodus furcatostriatus*.

Miall, L. C. Report on Labyrinthodonts of the Coal Measures. Rep. Brit. Assoc. for 1873, pp. 225–249, plates 1–3.

Deals with the general structure of the group. The form, composition, and mode of growth of the skull is first considered, the chief variations being pointed out and discussed. The succeeding sections relate to the Sclerotic Orbital Ring, Teeth, Vertebral Column, Ribs, Shoulder-girdle, Pelvic girdle, Bones of the Limbs, Hyoid, Branchial Arches, Dermal Armour, Nature of Food, and Mode of Life, Zoological Affinity, and Distribution. The author offers reasons for reconsidering Prof. Owen's views respecting the disproportion of fore and hind limbs in the large Triassic species, and discusses the relation of Labyrinthodonts to the "Stammbäume" proposed by Haeckel. L. C. M.

MIALL, L. C. On the Remains of Labyrinthodonta from the Keuper Sandstone of Warwick. Quart. Journ. Geol. Soc. vol. xxx. pp. 417–435, pls. xxvi.–xxviii.

Remains of *Mastodonsaurus* and *Labyrinthodon* are described and figured. *Diadetognathus varvicensis* is proposed as a new genus and species. Prof. Owen's memoir (Geol. Trans. ser. 2, vol. vi.) is reviewed, and certain determinations of bones criticised. The English Triassic Labyrinthodonts are enumerated as follows—*Mastodonsaurus giganteus*, *M. pachygnathus*, *Labyrinthodon leptognathus*, *Diadetognathus varvicensis*. L. C. M.

——. On the Composition and Structure of the Bony Palate of *Ctenodus*. Quart. Journ. Geol. Soc. vol. xxx. pp. 772–774, plate xlvii.

——. Note on the occurrence of a Labyrinthodont in the Yoredale Rocks of Wensleydale. Quart. Journ. Geol. Soc. vol. xxx. pp. 775, 776.

Parts of one hind limb and a tibia of the other are described. The remains indicate a large species, such as *Loxomma Allmani*.

MILNE-EDWARDS, ALPHONSE. Recherches sur la Faune ancienne des îles Mascareignes. [Ancient Fauna of the Mascarene Islands.] Ann. Sci. Nat. ser. 5, Zool. t. xix. pp. 31, with five plates.

Bones of several birds are described, most of them as new forms. *Erythromachus Leguati*, new gen. and sp., is allied to the N. Zealand Apteryx. *Ardea megacephala*, a large heron, and *Strix (Athene) murivora*, a new owl. Bones of a pigeon still living in Madagascar (*T. picturatus*) are recognized, and of another, *Columba rodericana*, named as new. A new genus is made for the large perroquet *Necropsittacus rodericanus*. Of mammals, bats, flying foxes, a pig, &c. are mentioned, but are mostly of species existing in Madagascar. E. B. T.

NEWBERRY, Prof. J. S. Notes on the genus *Conchiopsis*. Proc. Ac. Nat. Sci. Philadel. ser. 3, vol. iv. pp. 425, 426.

——. On *Castoroides Ohioensis*. Proc. Lyc. Nat. Hist. N. York, ser. 2, no. 4, pp. 92, 93.

Notice of a great extinct beaver from Post-Tertiary deposits (peat) at Nashport, on the Ohio Canal.

Newberry, J. S. On a second species of *Dinichthys*. Proc. Lyc. Nat. Hist. N. York, ser. 2, pp. 149–151.

Discovered in the Huron shale near Avon Point, Lorain County, Ohio, and named *Dinichthys Terrelli*. In one specimen the median plate of the back has a diameter of 30 inches. G. A. L.

Owen, Prof. Richard. Monograph on the Fossil Reptilia of the Wealden and Purbeck Formations.—Supplement V. Dinosauria (*Iguanodon*), pp. 1–18, pls. i., ii. Palæont. Soc. for 1873.

A dentary piece of the mandible of *Iguanodon* is figured and described. Towards the symphysial end the edentulous part of the ramus is curved downwards and inwards " to meet the corresponding part of the opposite ramus at a short symphysis, extending along a horizontal surface, parallel with the straight lower border of the mandible. The smooth canal thus formed above the symphysis indicates a relation of facility in regard to the movements of protrusion and retraction of a long, cylindrical, muscular tongue, probably used, like that of the Giraffe and Megatherium, for the prehension of the vegetable substances selected by the *Iguanodon* for food. It is a generic mandibular character." A part of a mandibular ramus of *Iguanodon Mantelli*, from the " Under Feather" limestone (Middle Purbeck), yields the first unequivocal example of this genus from the Purbeck series. The skull named *Hypsilophodon Foxii* by Huxley (Quart. Journ. Geol. Soc. vol. xxvi. p. 3) is refigured and described. Prof. Owen proposes to unite it with *Iguanodon*, distinguishing the species from *I. Mantelli* by " the defined rise of the basal border of the coronal enamel on both the outer and inner sides of the tooth, especially the latter; the relatively larger size and smaller number of the marginal serrations; the larger relative size and more definite median position of the primary longitudinal ridge." Prof. Huxley's statement that the crown of the tooth was non-serrate is contradicted. " The conformity of cranial structure, as of fundamental tooth-type, between *Scelidosaurus*, *Echinodon*, and *Iguanodon*, now exemplified by the small skull (pl. i. fig. 9), makes it convenient to associate the genera in a section of *Dinosauria*, which may be termed '*Prionodontia*,' *i. e.* serrident, or saw-toothed." L. C. M.

——. Ditto.—Supplement VI. Crocodilia (*Hylæochampsa*), pp. 1–7, pl. ii. of Supplement V. figs 23–25. Palæont. Soc. for 1873.

The skull of a small or young Crocodilian, from the Wealden, I. of Wight, is figured and described. The occipital surface, supratemporal fossæ, orbits, and palate are displayed. A pair of large vacuities, bounded apparently by the palatine and pterygoid bones, may be either the palatine foramina or the posterior nares. L. C. M.

——. Monograph on the Fossil Reptilia of the Mesozoic Formations.—Part I. Pterosauria (*Pterodactylus*, Gault-Lias), pp. 1–14, pls. i., ii. Palæont. Soc. for 1873.

Pterodactylus Daviesii, n. sp., is described from a mandibular symphysis and teeth found in the Gault at Folkestone.—*P. sagittirostris*,

n. sp., from the Wealden, is represented by a mandible, of which the symphysis is wanting. It is assigned provisionally to the genus *Pterodactylus*, of which *P. longirostris* is the type. The length of the ramus between the articular surface and the posterior end of the symphysis is estimated at 13 inches. The teeth are subsimilar, nearly equidistant. Both jaws are believed to be broader and less compressed than in *P. compressirostris*.—*Coloborhynchus clavirostris*, n. sp. A Pterodactyle from the Wealden, of the "truncirostral" section. "The small anterior pair of premaxillary teeth project from the front surface of the bone, and at a greater elevation above the palate and the sockets of the second pair than in *Coloborhynchus Cuvieri* or *Colob. Sedgwickii*."—Fragments of humeri from the Kimmeridge Clay are referred to *P. Mansellii* and *P. Pleydellii*. Phalanges of the "wing-finger" from the Great Oolite are described under the names of *P. Kiddii*, *P. Duncani*, and *P. Aclandi*. *P. Marderi*, from the Lias, is described from the proximal half of a humerus.—The distal end of a humerus of *Dimorphodon macronyx* is noticed. L. C. M.

Owen, Prof. Richard. Note on the alleged existence of Remains of a Lemming in Cave-deposits of England. Proc. Roy. Soc. vol. xxii. pp. 364, 365.

A Pika, or tailless Hare, found in Brixham Cave, is incorrectly named Lemming in the "Report on the Exploration of Brixham Cave" (Phil. Trans. 1873), though the true technical name, *Lagomys spelæus*, is given. L. C. M.

——. On the Fossil Mammals of Australia.—Part VIII. Family Macropodidæ: Genera *Macropus*, *Osphranter*, *Phascolagus*, *Sthenurus*, and *Protemnodon*. Phil. Trans. vol. clxiv. pt. 1, pp. 245–287, plates 20–27.

The following species are described, and their relationship to existing Kangaroos pointed out—*Macropus Titan* (Breccia Cave, Wellington Valley, Freshwater-deposit, Darling Downs), *M. affinis*, *Osphranter Cooperi* (Freshwater-deposit, Darling Downs), *O. Gouldii*, *Phascolagus altus* and *Sthenurus Atlas* (Breccia Cave and Freshwater-deposits), *S. Brehus* (Breccia Cave), *Protemnodon Anak* (Freshwater-deposits, Darling Downs), *P. Og*, *P. Mimas* (Breccia Cave &c.), *P. Ræchus*.
R. E., Jun.

——. Ditto.—Part IX. Family Macropodidæ: Genera *Macropus*, *Pachysiagon*, *Leptosiagon*, *Procoptodon*, and *Palorchestes*. Phil. Trans. vol. clxiv. pt. 2, pp. 783–798, plates 76–83.

Parts of the skull of the following genera and species (the majority new) are described and figured, viz.:—*Macropus Titan*; *M. Ferragus*. Subgenus *Pachysiagon*: *P. Otuel*. Subgenus *Leptosiagon*: *L. gracilis*. Genus *Procoptodon*: *P. pusio*; *P. Rapha*; *P. Goliah* (=*Macropus Goliah*). *Loc.* Wellington-Valley Caves, New S. Wales. Genus *Palorchestes*: *P. Azael*. *Loc.* Victoria. R. E., Jun.

Painter, Rev. W. H. More about Carboniferous Fish. Science Gossip, no. 119, pp. 253, 254.

Notices some fish-remains in coal-shale, from an outlier on Baildon Hill, near Bradford.

Peach, C. W. Notice accompanying Specimen of *Holoptychius nobilissimus* from the Black Hill, near Melrose. Trans. Edin. Geol. Soc. vol. ii. part 3, p. 400.

From a quarry on the Black Hill of Earlston.

Pengelly, **William**. Notes on Dr. Rivière's Discovery of Three new Human Skeletons in the Mentone Caverns in 1873–74. Trans. Devon Assoc. vol. vi. part 2, pp. 560–566.

A *résumé* of a notice read to the Academy of Sciences in Paris by Dr. E. Rivière.

Pouech, l'Abbé. Note au sujet des restes d'un Éléphant fossile découverts à Parniers (Ariège). Bull. Soc. Géol. France, 3 sér. t. ii. pp. 8–13, 1 fig. in text.

A description of fragments of *Elephas primigenius* found in the ravine of Vicaria, W. of Parniers, in deposits belonging to the recent period.

Probst, —. Beitrag zur Kenntniss der fossilen Fische (*Labroiden*, *Scarinen*, *Sparoiden*) aus der Molasse von Baltringen. [Fossil fishes from the Molasse of Baltringen.] Jahresheft. Ver. Naturk. Württemberg, vol. xx. pp. 275–299, t. iv.

Redtenbacher, Dr. **Anton**. Reste von *Ursus spelæus* aus einer Höhle bei Wildalpe in Obersteiermark. [Remains of *Ursus spelæus* in a cave at Wildalpe, in Obersteiermark.] Verh. k.-k. geol. Reichs. pp. 16, 17.

Rivière, E. Sur trois nouveaux squelettes humains découverts dans les grottes de Menton, et sur la disparition des silex taillés et leur remplacement par des instruments en grès et en calcaire. [On three new human skeletons found in the caves of Mentone, &c.] Compt. Rend. t. lxxviii. pp. 569–573.

A detailed description of the skeletons and implements of bone and stone found in the Baoussé-Roussé caverns in June 1873 and in January 1874. G. A. L.

Roemer, **Ferd**. Ueber das Vorkommen des Moschus-Ochsen (*Ovibos moschatus*) in Diluvium Schlesiens. [Musk-Ox from Silesia.] Zeitsch. deutsch. geol. Gesell. Bd. xxv. pp. 600–604.

Description of the posterior part of a skull of *Ovibos moschatus* in the Breslau University. The matrix is a coarse grey sandy loam, probably from Kamnig, in Silesia; but the locality is not definitely known. This is the fourth example of this species recorded from Germany. Five woodcuts of the skull accompany the paper. F. W. R.

Rütimeyer, L. Ueber den Bau von Schale und Schädel bei lebenden und fossilen Schildkröten als Beitrag zu einer paläontologischen Geschichte dieser Thiergruppe. [Structure of shell and skull in living and fossil Shield-Reptiles, &c.] Verh. naturf. Gesell. Basel, 6 Theil, Heft 1, pp. 1–137.

Contains a short synopsis of genera and species of *Chelonia* found fossil at Solothurn, and described in the author's previous paper (Memoirs Swiss nat. sci. Assoc. vol. xxv.), and discusses their affinities to recent shield-reptiles; notices fossil *Chelonidæ* from other European localities. *Chelone pulchriceps* and *C. Benstedi* of Owen are said not to be Sea-Turtles at all, but allied to *Chelydidæ*, and the former to *Chelymys*. *Platemys Bullockii*, Ow., is supposed not to differ from *Pleurosternon*. The Eocene *Chelonidæ* described by Owen, it is suggested, might be formed into a new group, *Chelonemydidæ*, as they have the skulls of Turtles but the shields of *Emydidæ*. E. B. T.

Sauvage, Dr. H. E. Sur la faune ichthyologique de l'époque tertiaire. [Ichthyological Fauna of the Tertiary Epoch.] Compt. Rend. 2 sess. Assoc. Franç. pp. 443–445.

Arrives, amongst others, at the following conclusions:—1. During the Chalk period Indian and Pacific types predominated, mixed with a few Atlantic forms, especially in the warmer parts of the ocean. 2. The Mediterranean and Atlantic types gain an importance in Tertiary times. 3. In Tertiary times there was communication between the Indian Ocean and the Mediterranean. 4. There was direct communication between the old and new continents, which seems to have lasted longest in the north. G. A. L.

——. Notes sur les reptiles fossiles.—I. Sur deux tortues du terrain Kimméridgien de Boulogne-sur-Mer. II. Sur une émyde des Lignites tertiaires des Basses-Alpes. III. De la présence du genre Ptérodactyle dans le jurassique supérieur de Boulogne-sur-Mer. IV. Du genre *Liopleurodon*, Sauvage. V. Sur le genre *Dacosaurus*, Quenstedt. VI. Sur une dent de Mosasaure de la craie supérieure de Bonneville (Manche). Bull. Soc. Géol. France, 3 sér. t. i. pp. 365–386, pls. vi.–viii.

The new species described are—*Plesiochelis Beaugrandi*, *P. Dutertrei*, *Platyemys Lachati*, *Pterodactylus suprajurensis*, *Liopleurodon ferox*, *L. Grossouvrei*, *Dacosaurus primævus* = *Dakosaurus maximus* (Wood-Mason, not Quenstedt), *Mosasaurus platyodon*. G. A. L.

Seeley, H. G. On *Murænosaurus Leedsii*, a Plesiosaurian from the Oxford Clay.—Part I. Quart. Journ. Geol. Soc. vol. xxx. pp. 197–208, pl. xxi.

The skull, vertebral column, coracoids, scapulæ, pelvic bones, and fore limb are described. The distinctive characters of the new genus and species are not given separately. L. C. M.

——. Note on some of the Generic Modifications of the Plesiosaurian Pectoral Arch. Quart. Journ. Geol. Soc. vol. xxx. pp. 436–449.

Discusses various restorations of the Plesiosaurian pectoral arch, and illustrates his views by a comparison with *Chelone*. The British *Plesiosauria* are divided into the restricted genus *Plesiosaurus*, with a large interclavicle, and the following new genera, which want the interclavicle—*Eretmosaurus*, *Colymbosaurus*, and *Murænosaurus* (see above). A new genus, *Rhomaleosaurus*, is proposed for the species named *Plesiosaurus Cramptoni* by Mr. Baily and Dr. Carte. L. C. M.

SEELEY, H. G. On the Base of a large Lacertian Cranium from the Potton Sands, presumably Dinosaurian. Quart. Journ. Geol. Soc. vol. xxx. pp. 690–692, pl. xliv.

The fossil is interpreted as the anchylosed basioccipital and basisphenoid of a Dinosaur. A long, deep, ovate cup on the upper surface of the basisphenoid is considered to be the base and anterior portion of the brain-case. The author regards the bone as indicating that, in at least one order of Dinosauria, the bones of the base of the cranium resembled *Hatteria* rather than birds. The fossil is named *Craterosaurus pottonensis*. L. C. M.

——. On Cervical and Dorsal Vertebræ of *Crocodilus cantabrigiensis* (Seeley), from the Cambridge Upper Greensand. Quart. Journ. Geol. Soc. vol. xxx. pp. 693–695.

" The anterior inclination of the cervical centrum, and the depression of the dorsal neural arch, ... are the most distinctive characters of *Crocodilus cantabrigiensis*."

——. On the Pectoral Arch and Fore limb of *Ophthalmosaurus*, a new Ichthyosaurian Genus from the Oxford Clay. Quart. Journ. Geol. Soc. vol. xxx. pp. 696–707, pls. xlv., xlvi.

——. On the Tibia of *Megalornis*, a large Struthious Bird from the London Clay. Quart. Journ. Geol. Soc. vol. xxx. pp. 708–710 [with a woodcut].

STUDER, TH. [Notes on Bones of Domestic and Wild Animals from Locras and Mærigen.] Indicateur des antiquités suisses, p. 507.

TAYLOR, J. E. On the occurrence of Elephant-remains in the Basement Beds of the Red Crag. Rep. Brit. Assoc. for 1873, Sections, p. 91.

The tooth referred to was peculiar, from the width of the ridges and its singular resemblance to the Mastodon type. The author stated that elephant-remains do occur in the bed in question—a fact which had been previously doubted. W. T.

TRAQUAIR, R. H. Description of *Cycloptychius carbonarius*, Huxley, from the Coal-measures of North Staffordshire. Geol. Mag. dec. 2, vol. i. pp. 241-246, t. xii.

The structure is fully described from specimens in Mr. Ward's collection, and a place among the Palæoniscidæ is assigned to this fish.

Traquair, R. H. On *Uronemus magnus*, a new fossil fish from the Coal-measures of Airdrie, Lanarkshire. Geol. Mag. dec. 2, vol. i. pp. 554, 555.

This is referred with confidence to the Phaneropleurini, and with some hesitation to the genus *Uronemus*.

——. On a new Genus of Fossil Fish of the Order Dipnoi. Journ. Roy. Geol. Soc. Ireland, ser. 2, vol. iv. part 1, pp. 1–4, plate.

Describes a fragment of bone now in the British Museum, and considered by Agassiz identical with the intermaxillary bone of *Megalichthys*. Regards it as closely allied to *Dipterus*, and therefore includes it in the order Dipnoi. The superficial characters and internal microscopic structure are described, and the name *Ganorhynchus Woodwardi* is proposed. The locality and formation of the fossil are unknown: from its appearance one might be tempted to infer that it is Palæozoic.

E. T. H.

Vasseur, G. Sur le pied de derrière de l'*Hyænodon Parisiensis*. [Hind foot of *Hyænodon Parisiensis*.] Compt. Rend. t. lxxviii. pp. 1446, 1447.

The discovery of part of a humerus of this species at Romainville, and of a hind foot, all but perfect, in the gypsum of Rosny, confirms M. Gervais's assertion that both the Hyænodons and the Pterodons must be placed among the Carnivora, and not among the Marsupials.

G. A. L.

Woodward, H. New Facts bearing on the Inquiry concerning Forms intermediate between Birds and Reptiles. Quart. Journ. Geol. Soc. vol. xxx. pp. 8–15.

Reviews the facts which have been adduced to support the relationship of birds to reptiles, and illustrates a bipedal track from the Solenhofen Limestone by observations on the gait of the Frilled Lizard of Australia (*Chlamydosaurus Kingii*). L. C. M.

——. On the Remains of *Rhinoceros leptorhinus*, Owen (*Rh. hemitœchus*, Falconer), in the Collection of Sir Antonio Brady, F.G.S., from the Pleistocene Deposits of the Valley of the Thames at Ilford, Essex. Geol. Mag. dec. 2, vol. i. pp. 398–403, pl. xv.

The presence of a bony nasal septum in this species is established by the observations of Mr. Davies.

Yates, L. G. Extract of a Letter relating to Mammalian Fossils in California [and reprint of a newspaper slip giving localities for proboscidean remains in California]. Proc. Ac. Nat. Sci. Philad. ser. 3, vol. iv. pp. 18–21.

See also Abth, p. 283.

2. *INVERTEBRATA.*

Alth, Dr. Alois von. Ueber die palæozoischen Gebilde Podoliens und deren Versteinerungen. Erste Abtheilung. [Palæozoic formations of Podolia and their fossils.] Abh. k.-k. geol. Reichs. Band vii. Heft 1, pp. 77, 5 plates.

The first 32 pages are geological (see p. 45); the rest consists of descriptions and figures of the crustaceans and fishes. The remains of fishes are found partly in the Ludlow Beds and partly in the overlying Devonians, and are referable to M'Coy's Placodermi and to the Cephalaspidæ. The following new species are figured and described—*Pteraspis podolicus* (Ludlow), *P. major* (Ludlow and Devonian), *P. angustatus* (Ludlow), *Cyathaspis Sturi* (Ludlow), *Scaphaspis radiatus* (Ludlow), *S. Haueri* (Devonian), *S. elongatus* (Devonian), and *S. obovatus* (Ludlow).

The crustaceans are referable to the Eurypterida, Trilobita, and Ostracoda; and the following new species are described—*Proetus podolicus*, *P. Dzieduszychianus*, *Cyphaspis rugulosus*, *Beyrichia podolica*, *B. Reussi*, *B. Bilczensis*, *B. inornata*, *Primitia rectangularis*, and *Leperditia Römeri*. H. A. N.

Baily, W. H. Palæozoic Echinida: *Palæchinus* and *Archæocidaris*. Journ. Roy. Geol. Soc. Ireland, ser. 2, vol. iv. pt. 1, pp. 40–43 (2 plates).

The author figures the original example of *Palæchinus gigas*, from the Lower Carboniferous Limestone-shale of Raheen, Donegal, and shows that the structure of this species had been somewhat misconceived by Prof. M'Coy. The author also describes and figures a new species of *Archæocidaris*, the only example in which the parts retain their original form and connexion. This species (*A. Harteiana*) shows the apical disk, ambulacral areas, and interambulacral areas—the latter composed of five rows of plates, each alternate plate having a large perforated tubercle, and having the rest of its surface covered by smaller tubercles or granulations. The specimen was obtained from the Lower Carboniferous Grit of Lough Eske, near Donegal. E. T. H.

——. Palæontological Notes. Explanation of Sheets 47, 76, and 77, Geol. Survey, Ireland. (See Egan, p. 10, and Wilkinson, p. 39.)

Barrande, Joachim. Système Silurien du Centre de la Bohême.—Première Partie. Recherches Paléontologiques, vol. ii. Texte, 3 part, pp. 804.

A continuation of the series of works upon the Cephalopoda of the Silurian basin of Bohemia. Gives descriptions of the species of *Ortho-*

ceras, *Adelphoceras*, *Bathmoceras*, *Tretoceras*, and *Bactrites*. The plates were published at previous dates. The preliminary portion discusses the classification and grouping of the species of *Orthoceras* adopted and published by the author ('Groupement des Orthocères,' 1868). The basis of this classification rests on the "short-coned" or "long-coned" form of the shell, the subordinate groups being founded on the nature of the external ornamentation, the form of the transverse section of the shell, the position of the siphuncle, and other minor characters. A description of the general characters of the "short-coned" *Orthocerata* follows, attention being directed to the general form of the shell, to the limits and variations of the apical angle, to the initial extremity, transverse section, body-chamber, air-chambers, aperture, and septa of the shell, to the position, form, and constituent elements of the siphuncle, to the thickness and ornamentation of the shell, to the relations of the group with the short-coned species of *Cyrtoceras* and the long-coned *Orthocerata*, and to the distribution of the group in Bohemia and elsewhere. The next part (pp. 35–99) describes the species of the short-coned group of *Orthocerata* in Bohemia, 65 species, all new, being described. [Owing to the great number of new species described in this work, it has not been thought advisable to give a list of the names.] After a consideration of the general characters of the long-coned *Orthocerata*, the author divides this section into 21 groups, and describes the species belonging to these. A short section is devoted to the discussion of the general characters of each group, and to the distribution of the species of the group in time. In all 457 species of long-coned *Orthocerata* from the Bohemian basin are described, almost all of them being new (pp. 100–678). Under the section of the long-coned *Orthocerata* are placed the subgenera *Huronia* (with no Bohemian species), *Endoceras* (with three Bohemian species), and *Gonioceras* (with no Bohemian representative).

The second division (pp. 679–758) gives descriptions of those species of Cephalopoda known to occur in countries outside Bohemia, but figured in the previously published volume of plates. The forms in question comprise:—2 species of *Orthoceras* and 1 of *Trochoceras* from the Devonian formation of France; 2 species of *Orthoceras* from Great Britain; 21 species of *Orthoceras* (including *Endoceras*) from Sweden; 1 species of *Orthoceras* and 3 species of *Endoceras* from Russia; 1 species of *Orthoceras* from the Silurian of Franconia, and 1 from the Carboniferous of Belgium; 1 species of *Nautilus*, 2 of *Orthoceras*, 2 of *Endoceras*, and 1 of *Trochoceras* (?) from the Silurian of Newfoundland; 2 species of *Cyrtoceras*, 14 of *Orthoceras*, 4 of *Huronia*, 3 of *Endoceras*, and 1 of *Orthoceras*? (*Discosorus*) from the Silurian deposits of Canada; and 4 species of *Orthoceras*, 2 of *Endoceras*, and 2 of *Huronia* from the Silurian rocks of the United States.

The third division (pp. 759–787) is a critical consideration of the characters of the genus *Orthoceras* proper, and of the subgenera *Huronia*, *Endoceras*, and *Gonioceras*. Under the amended genus *Orthoceras* the author places the following genera—*Actinoceras*, *Ormoceras*, *Conilites*, *Conotubularia*, *Koleoceras*, *Melia*, *Sannionites*, *Thoracoceras*, *Cycloceras*, *Loxoceras*, *Trematoceras*, *Cochlioceras*, *Dictyoceras*, and *Heloceras*. Under the subgenus *Endoceras*, as amended, the author places the genera *Cameroceras*, *Colpoceras*, and *Nothoceras*.

In the fourth division (pp. 788–804) we have descriptions of the genera *Adelphoceras*, *Bathmoceras*, *Tretoceras*, and *Bactrites*, and of the following species—*Adelphoceras Bohemicum*, *A. secundum*, *Bathmoceras complexum*, *B. præposterum*, and *Tretoceras parvulum*. H. A. N.

Bayan, —. Sur quelques fossiles paléozoïques de Chine. [Palæozoic fossils from China.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 409–415, pl. xvi.

These fossils come:—1, from the Valley of the Yang-tze-kiang; they are *Spirifer lineatus*, *Athyris ambigua*, *Meekella Garnieri*, n. sp., and *Bellerophon tangentialis*; and, 2, from Lean-Chan, *Productus Davidi*, n. sp., and *P. costatus*, var. *cœlestis*. G. A. L.

——. Jurassic *Pachyrisma*. See Addenda.

Bellardi, Prof. Bemerkungen über die in der Umgebung Wiens vorkommenden und von M. Hörnes (Foss. Moll. d. T. B. v. Wien) beschriebener Pleurotomen. [Remarks on the species of *Pleurotoma* which are found in the neighbourhood of Vienna, and have been described by M. Hörnes.] Verh. k.-k. geol. Reichs. pp. 155–157.

Billings, E. Memoirs of the Geological Survey of Canada, Palæozoic Fossils, vol. ii. part 1, pp. 144, with 85 woodcuts and 9 plates.

The first part gives a description of the fossils of the "Gaspé Series," some of the beds of which are Upper Silurian, others Devonian, with an intermediate group that may be regarded as passage-beds. The following new species are described—*Zaphrentis incondita*, *Z. rugatula*, *Z. corticata*, *Z. cingulosa*, *Phillipsastræa affinis*, *Polypora* (?) *Psyche*, *Dictyonema splendens*, *Ptilodictya tarda*, *Lingula Lucretia*, *L. Artemis*, *Crania bella*, *Chonetes Melonica*, *C. Canadensis*, *C. Dawsoni*, *C. Antiopa*, *Strophomena Galatea*, *S. Irene*, *S. Blainvillei*, *S. Tullia*, *Orthis Aurelia*, *O. Lucia*, *Rhynchonella excellens*, *R. Dryope*, *Spirifera Gaspensis*, *S. superba*, *Cyrtina affinis*, *Sanguinolites Tethys*, *Goniophora mediocris*, *Grammysia Canadensis*, *Modiomorpha inornata*, *Mytilarca Canadensis*, *M. nitida*, *Leptodomus Canadensis*, *Anodontopsis ventricosa*, *Cypricardinia distincta*, *Modiolopsis varia*, *Murchisonia Hebe*, *M. egregia*, *Pleurotomaria princessa*, *P. voltumna*, *P. Delia*, *P. Lydia*, *Platyostoma affinis*, *Bellerophon plenus*, and *Proetus Phocion*.

The second part gives descriptions of fossils from the Primordial Rocks of Bell Island, Newfoundland, the exact position of which beds is uncertain. Descriptions of these forms have been previously published (Can. Nat. 1872); but the following new species are now described—*Eophyton Jukesi*, *Arthraria antiquata*, *Lingula Murrayi*, *Lingulella* (?)

affinis, *Lingulella* (?) *spissa*, and *Cruziana similis*. From certain beds below those of Bell Island, and referable to the Lower Lingula Flags or Menevian group, the following new species are described—*Obolella* (?) *miser*, *Straparollina remota*, *Hyolithes excellens*, *Agraulos socialis*, *A. strenuus*, *A. affinis*, *Solenopleura communis*, *Anapolenus venustus*, *Paradoxides tenellus*, *P. decorus*, and *Iphidea bella*. From the Huronian Rocks of St. John's, Newfoundland, the following new species are described—*Aspidella Terranovica*, *Stenotheca pauper*, and *Scenella reticulata*—the last two being small patelliform Gasteropods, whilst the affinities of the first are uncertain. A discussion of the characters of the genus *Stricklandinia* next follows, with descriptions of *S. Canadensis*, *S. Gaspensis*, *S. brevis*, *S. Davidsoni*, *S. Salterii*, and a new species, *S. melissa*.

The next part is occupied with a discussion of the structure of the Crinoidea, Cystoidea, and Blastoidea (already published in Amer. Journ. 1869, 1870, and in Ann. Nat. Hist. 1870, 1871). A few corrections and additions are added.

The concluding part contains descriptions of certain fossils from the Upper Silurian rocks (Arisaig series) of Nova Scotia. The following species are described as new—*Orthonota venusta*, *O. incerta*, *O.* (?) *speciosa*, *O. simulans*, *Modiolopsis exilis*, *M. ruda*, *Goniophora transiens*, *G. consimilis*, *G. bellula*, *G. mediocris*, *Cytherodon* (?) *placidus*, *C.* (?) *socialis*, *Grammysia remota*, *G. rustica*, *G. Acadica*, *Pteritonella venusta*, *P. oblonga*, and *P. curta*. The genus *Pteritonella* is proposed for forms like *Pterinea retroflexa*, in which there are several small anterior teeth in front of the beaks, with several more or less elongated posterior teeth, and a strong anterior muscular impression. H. A. N.

BILLINGS, E. On some new or little-known Fossils from the Silurian and Devonian Rocks of Ontario. Canad. Nat. n. ser. vol. vii. pp. 230–240, figs. 1, 2.

Describes a new genus of Sponges, allied to *Aulocopium*, from the Niagara formation of Hamilton, Ontario, named *Aulocopina*; and the only species is termed *A. Granti*. Two new species of *Amplexus* (*A. exilis* and *A. mirabilis*) and six new species of *Zaphrentis* (*Z. invenusta*, *Z. Eriphyle*, *Z. Hecuba*, *Z. Egeria*, *Z. genitiva*, and *Z. subrecta*) are described, all from the Corniferous Limestone. The new genus *Heterophrentis* is founded to include certain forms (such as *Z. spatiosa* and *Z. prolifica*) previously referred to *Zaphrentis*, but differing in having usually a pseudo-columella, and in apparently possessing but a single tabula, which forms the floor of the calice; four species are described (*H. spatiosa*, *H. excellens*, *H. compta*, and *H. prolifica*). Finally, the author describes two new Cephalopods (*Gyroceras Numa* and *Orthoceras Anax*) and a new Trilobite (*Lichas superbus*), from the Corniferous Limestone. H. A. N.

——. On Mr. Meek's Note, p. 373 of this volume. Amer. Journ. ser. 3, vol. vii. p. 530.

Relates to the curious openings in the arms of *Actinocrinus*, and to the ambulacral pores in *Caryocrinus*, the latter of which he believes to be ovarian. G. A. L.

Boeck, Johann. Die geologischen Verhältnisse des südlichen Theiles des Bakony. [Geological Relations of the Southern Part of the Bakony.] Mittheil. Jahrb. kön. ung. geol. Anst. Bd. iii. Heft 1, Part 2, pp. 180 (6 plates).

After describing the geological structure (see p. 50), the author devotes 47 pages and 6 plates to the elucidation of some of the Secondary fossils and one Tertiary form. Several previously described forms are noticed; and the following new species, all from the Lias, are described and figured—*Lima Rothi*, *Turbo multistriatus*, *Terebratula Fötterlei*, *T. ovatissimæformis*, *T.* (*Waldheimia*) *Herendica*, *T.* (*Waldheimia*) *Bakonica*, *T.* (*Waldheimia?*) *linguata*, *Rhynchonella Urkutica*, *R. Hungarica*, *R. pseudopolyptycha*, *R. forticostata*, *R. Matyasovszkyi*, and *R. Hofmanni*. The work concludes with descriptions of *Ceratites Boecki* and *Ammonites Zsigmondyi*, both of which belong to the zone of *Ceratites Reitzi*, in the Trias of Bakony. H. A. N.

Booth, W. H. Chapters on Cuttles.—No. 3. Science Gossip, no. 110, pp. 26–28.

Relates to the fossil forms.

Bornemann, L. G., Jun. Ueber die Foraminiferen-Gattung *Involutina*. [On the Genus *Involutina*.] Zeit. deutsch. geol. Gesell. Bd. xxvi. pp. 702–740, pls. xviii., xix.

Enters into a discussion as to the structure, affinities, and history of the genus *Involutina*, giving an amended diagnosis of the genus, and referring to it *I. liasina*, Jones. The forms described by Terquem under the names of *I. silicea* and *I. aspera* are referred to *Ammodiscus*, Reuss, the former being identified with the *Orbis infimus* of Strickland, and standing therefore as *A. infimus*, Strickl., sp. The species described by Terquem as *I. polymorpha* and *I. limitata* are referred to a new genus, *Silicina*; and the author founds a second new genus, *Problematina*, for the reception of *I. Deslongchampsi*, *I. petræa*, and *I. nodosa*. In an appendix the author discusses the characters and position of the curious fossils described by Terquem under the name of *Annulina metensis*. H. A. N.

Bradley, F. H. Note on *Anomphalus Meeki*. Amer. Journ. ser. 3, vol. vii. p. 151.

A letter, in which the writer states that his species *Anomphalus Meeki* is not congeneric with *A. rotulus*, the type of the genus; he is obliged to consider it the type of a new genus, for which he proposes the name *Dawsonella*. G. A. L.

Brady, George, Rev. H. W. Crosskey, and D. Robertson. A Monograph of the Post-tertiary Entomostraca of Scotland, including Species from England and Ireland. Palæontographical Society, pp. 232, pls. i.–xvi.

Begins with an examination of the age, position, sequence, and nomenclature of the Post-tertiary deposits of Scotland which have either yielded Ostracoda or are related to beds containing their remains. The term "Boulder Clay" is defined; and it is pointed out that certain Boulder Clays are fossiliferous, and contain a more or less arctic fauna. Various fossiliferous deposits, not Boulder Clays and not postglacial, are next considered, under the heads:—(1) fossiliferous beds immediately beneath the Boulder Clay, either præglacial, interglacial, or glacial, and not having any Boulder Clay for their base; (2) fossiliferous beds intercalated between masses of Boulder Clay; (3) fossiliferous clays, sands, and gravels with a more or less intensely arctic fauna; (4) clays and sands, with an arctic fauna, either immediately overlying unfossiliferous Boulder Clay, or separated from it by a thin seam of laminated clay. The various Ostracodiferous deposits of Scotland are next reviewed; and a section is devoted to the general sequence of the Post-tertiary beds of Scotland. The authors then describe the Post-tertiary deposits of England and Ireland, which had been examined by them for Ostracoda. The classification of the Ostracoda is treated of, in connexion with a table giving the characters of the genera as derived from a study of the carapace, and a synopsis of the genera, based upon the anatomical characters of the animal. The introductory part concludes with a summary of the facts known as to the distribution of the Post-tertiary Ostracoda, and a bibliography of the works referred to in determining the synonymy of the species.

The rest is occupied with descriptions of 133 species of Ostracoda, recognized by the authors as occurring in the Post-tertiary deposits of Great Britain. The following new species are described—*Aglaia* (?) *glacialis*, *Bairdia* (?) *cambrica*, *Cythere deflexa*, *C. cribrosa*, *C. Cluthæ*, *C. Hoptonensis*, *Limnicythere* (?) *antiqua*, *Cytheridea* (?) *inornata*, *Krithe glacialis*, *Cytherura pumila*, *C. concentrica*, *C.* (?) *complanata*, *C. compressa*, *Cytheropteron arcuatum*, *C. inflatum*, *C. montrosiense*, *Bythocythere elongata*, *Cytherideis subspiralis*, *Paradoxostoma* (?) *pyriforme*, *P. tenerum*, and *Bosquetia robusta*. The new genus *Bosquetia* is described, and is provisionally referred to the Cytherellidæ. The monograph concludes with a table, illustrating the distribution of the Ostracoda over Post-tertiary localities. H. A. N.

BRADY, HENRY B. On a true Carboniferous Nummulite. Ann. Nat. Hist. ser. 4, vol. xiii. pp. 222–230, pl. xii. Translated in 'Traductions et Reproductions publiées par la Société Malacologique de Belgique.'

After discussing the views of other authorities as to the distribution in time of the genus *Nummulina*, and pointing out that various palæontologists had given in their adhesion to the existence of Præ-tertiary Nummulites, the author describes a Nummuline fossil from the Carboniferous Limestone of Namur. The name *Nummulina pristina* was given to this fossil; and the author concludes that there could be no doubt as to its being a genuine Nummulite. It forms minute convex disks, about $\frac{1}{30}$ inch in diameter and $\frac{1}{70}$ inch thick, with a smooth surface, and composed of a spiral of three or four nearly equal convolutions, divided into chambers by curved septa. The minute tubulation of the shell is perfectly preserved; and the canal-system of the septa can also be determined. H. A. N.

Brauns, Dr. D. Der obere Jura im nordwestlichen Deutschland, von der oberen Grenze der Ornatenschichten bis zur Wealdbildung, mit besonderer Berücksichtigung seiner Molluskenfauna. [Upper Oolites of N. W. Germany.] 8vo. Braunschweig. Pp. 434, with 3 plates of fossils.

On the same plan as the former works on the L. and M. Jura. The ground covered by the present volume extends from the Coral Rag to the Purbecks. The N. German U. Oolites are divided into the following sections:—1, *Perarmatus*-beds; 2, *Cidaris florigemma* beds, or Coralline Oolite; 3, L. Kimmeridge; 4, M. Kimmeridge; 5, U. Kimmeridge; 6, *Ammonites gigas* beds; 7, Purbecks. Sections and leading fossils, with their places of occurrence are given under each head. The second part consists of a critical history of all the Mollusca known from these beds. The chief feature of this palæontological part is the position taken up, that only zoological characters are regarded in the definition of species; hence the latter are very comprehensive. The result is a total of 282 Mollusca in the N.W. German U. Jurassics, of which only 10 pass up from the M. Jurassic (U. Lias to M. Oolite). In the author's L. Jurassic (=L. and M. Lias) were described 215 species, and in the M. Jurassic 196 species. The thickness of these U. Jurassic beds is about 350 metres.

The following new species are described and figured:—*Gervillia Osnabruckensis*, from U. Kimmeridge of Lauenstein, and *Turbo Witteanus*, from the L. Kimmeridge of Ahlem. E. B. T.

Brodie, Rev. P. B. The Distribution and Correlation of Fossil Insects, and the supposed occurrence of Lepidoptera and Arachnida in British and Foreign Strata, chiefly in the Secondary rocks. 37th Ann. Rep. Warwickshire Nat. Hist. and Archæol. Soc. (for 1873), pp. 12–28.*

Notices the formations in which remains of insects have chiefly been found, the condition of those remains, and their entomological affinities, and concludes with a long list of insects from the English Tertiary formations and Wealden Beds, from the Solenhofen limestone &c., from English Oolitic deposits (chiefly Stonesfield Slate), from the Purbeck Beds and the Lias, and from Permian, Carboniferous and Devonian rocks. W. W.

Brusina, Spiridion. Fossile Binnenmollusken aus Dalmatien, Kroatien und Slavonien. [Fossil Mollusca, Dalmatia, &c.] German version enlarged from the Croatian. (S. Slavish Academy, Agram), 7 plates.

Bucaille, M. E. Echinides fossiles du Département de la Seine Inférieure. [Echinidæ of the Seine Inférieure.] Bull. Soc. Géol. Norm. t. i. 2 fasc. pp. 85–192. [Continued from fasc. 1. p. 84 (1873)].

The concluding part of the monograph. The species which are apparently new are:—*Cidaris Heva*, L. Cenomanian; *Cidaris*, sp.?, M. Senonian; *Cidaris Pennetieri*, M. Senonian; *Cidaris subpyriformis*, M. Senonian, and *Magnosia Sequana*, L. Cenomanian. All the 42 species mentioned are fully described, and their localities and beds given. G. A. L.

Butler, A. G. Notes on the Impression of *Palæontina Oolitica* in the Jermyn-Street Museum. Geol. Mag. dec. 2, vol. i. pp. 446–449, pl. xix.

Mr. Scudder having disputed the Lepidopterous character of the wing from the Stonesfield Slate (Geol. Mag. vol. x. p. 2), and having referred it to the Homoptera, the author defends his position, and gives reasons for believing that the opinion of Mr. Scudder cannot be sustained, and that *Palaeontina Oolitica* is a genuine Lepidopteron. H. A. N.

Carpenter, Dr. William B. Remarks on Mr. H. J. Carter's Letter to Prof. King on the structure of the so-called *Eozoön Canadense*. Ann. Nat. Hist. ser 4, vol. xiii. pp. 277–284, figs. 1, 2.

Maintains the organic nature of *Eozoön Canadense*, and recapitulates the evidence in favour of the view that it is Foraminiferous. Concludes by remarking that whilst the Foraminiferal nature of *Eozoön* can perhaps not be *proved* in a demonstrative sense, "the convergence of a number of separate and independent probabilities, all accordant with that hypothesis, while a separate explanation must be invented for each of them on any other hypothesis, gives it that high probability on which we rest in the ordinary affairs of life, in the verdicts of juries, and in the interpretation of geological phenomena generally." H. A. N.

——. New observations on *Eozoön Canadense*. Ann. Nat. Hist. ser 4, vol. xiii. pp. 456–470, figs. 1 and 2, and pl. xix.

Replies to the objections urged by Professors King and Rowney, and Mr. Carter, against the organic nature of *Eozoön* and its reference to the *Foraminifera*. In particular the objection that the supposed "nummuline tubuli" of *Eozoön* frequently lie parallel with the chamber-walls instead of being perpendicular to them, and that these structures can thus not be Foraminiferous, is shown to be baseless by an appeal to the structure of the test of *Nummulina*. Concludes with a summary of the general evidence in favour of the organic nature of *Eozoön*, and of its being referable to the *Foraminifera*. H. A. N.

Carter, H. J. On the structure called *Eozoön Canadense* in the Laurentian Limestone of Canada. Ann. Nat. Hist. ser 4, vol. xiii. pp. 189–193.

Letter recording the results of his examination of specimens of *Eozoön*, and expressing his opinion that it is of a purely mineral nature. H. A. N.

Carter, H. J. On the structure called *Eozoön Canadense* in the Laurentian Limestone of Canada. Ann. Nat. Hist. ser. 4, vol. xiii. pp. 376-378.

Supplements his former paper by further observations which he believes show that *Eozoön* is not organic, but in reality of a mineral nature. H. A. N.

——. On the Striae of Foraminiferous Tests; with a reply to Criticism. Ann. Nat. Hist. ser 4, vol. xiv. pp. 138-144.

Gives details of the structure of the test of the Nummulite, as bearing upon the nature of *Eozoön Canadense.*

Conrad, T. A. Remarks on the Tertiary Clay of the Upper Amazon, with descriptions of New Shells. Proc. Ac. Nat. Sci. Philadel. Part 1, pp. 25-82, pl. 1.

Almost wholly palæontological. The following new species are described:—*Pachyodon dispar, P. cuneiformis, Dreissena scripta, Anodonta Pebasana, Triquetra longula, Ostomya papiria, Planorbis Pebasana, Pachytoma tertiana, Toxosma eborea, Cirrobasis venusta, Liosoma curta, Cyclocheila Pebasana, Hemisinus Steerii.* W. W.

——. Description of two new Fossil Shells of the Upper Amazon. Proc. Ac. Nat. Sci. Philadel. part ii. pp. 82, 83, pl. xii.

The species from the Pebas Clay belong to the Unionidæ, and are named *Haplothærus capax* and *Hemisinus tuberculiferus.* There is also a figure of *Pachyodon tenuis.* W. W.

Cornet, F. L., and A. Briart. Compte-Rendu de l'excursion faite aux environs de Ciply par la Société Malacologique de Belgique, le 20 Avril 1873. [Account of excursion to the neighbourhood of Ciply.] Ann. Soc. Mal. Belg. t. viii. Mém. pp. 21-35.

A sketch (with short lists of fossils) of the Cretaceous Fauna of Ciply.

Cornuel, J. Description des Fossiles d'eau douce du fer oolithique ou fer néocomien supérieur de la Haute-Marne. [Descriptions of the freshwater fossils of the pisolitic iron (Upper Neocomian) of the Haute-Marne.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 371-398, pls. xiii.-xv.

Divided into four parts, of which the first consists of descriptions of the following new species:—*Paludina Wassiacensis, Paludestrina bulimoides, Cyclas Neocomensis, Unio scutella, U. elongata, U. subovalis, U. cochlearella, U. turgidula, U. ventricosa, U. semirecta.* All from Wassy.

The second part treats of the unequal distribution of the freshwater fossils in these deposits of limonite. The third gives evidence to show that the fossils lived where they are now found. The fourth part (pp. 383-397) is a discussion of the classification of the Neocomian series of the Eastern Paris Basin, and is accompanied by a folding table correlating the beds with those of the Neocomian series of part of the Mediterranean Basin. The pisolitic iron-deposit is the highest member of the Middle Neocomian. According to the author, it is proved that the upheaval, which began before the deposition of the *Ostrea* clay of the Paris Basin, is the same as that which began before the lower *Caprotina* limestones of the Mediterranean Basin, and that one submergence put an end to the latter and brought on the red bed of Wassy, the *Ostrea* clay and the red bed being respectively below and above the iron-deposit. G. A. L.

COTTEAU, G. Sur les Oursins des Antilles suédoises. [Echinidæ of the Swedish West Indies.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 125, 126.

Note, preliminary to a future complete list, to call attention to the fact that a striking resemblance exists between the Miocene Echinidæ of the Antilles and those of the same age of Malta and of other Mediterranean islands. Not only do the same genera abound, but some of the species are identical. This resemblance does not extend to Eocene forms. G. A. L.

——. Echinides irréguliers. Paléontologie Française, Terrain Jurassique, ix. pp. 449–551, plates 121–142. Résumé in Bull. Soc. Géol. France, 3 ser. t. ii. pp. 433–438.

The continuation of this work on the French Jurassic Echinidæ treats of the genus *Pygaster*, of which 15 species are described, the following being new:—*P. Icaunensis*, from the Bath Oolite of Asnières, Yonne; *P. Peroni*, from the Bath Oolite of Valeury, Var; and *P. Gauthieri* from Espuron, Var, perhaps of Oxfordian age. In the Supplement which follows, several corrections and additions are made to the species treated in the earlier numbers: e. g., *Metaporhinus transversus* is identified with *M. convexus*, Cat.; *Clypeus Osterwaldi* is altered to *C. altus*, with which it is identical; *Hyboclypeus subcircularis*, a new species, is added. The geological distribution of the genera and species is then discussed, as in other volumes. E. B. T.

DALL, W. H. Notes on some Tertiary fossils from the California Coast. Proc. California Ac. Sci. Feb. and March.

DAMES, Dr. N. Jahrb. Heft 6, pp. 613–615. [Examination of Dr. Braun's criticisms of the author's determination of several species of Jurassic Echinoderms.]

DAMES, W. Ueber Diluvialgeschiebe cenomanen Alter. Zeitsch. deutsch. Geol. Gesell. Bd. xxvi. Heft 4, pp. 761–774; plate.

Describes drift-pebbles of Cenomanian age from Bromberg. They contain the following new species:—*Pecten (Amusium) balticus*, *Avicula seminuda*, and *Lingula Krausei*. The pebbles are derived from a deposit resembling the Bornholm Greensand, but older. F. W. R.

Davey, E. C. The "Sponge-gravel" near Faringdon. Photographs and notes of fossils, see p. 8.

Davidson, Thomas. Monograph of the British Fossil Brachiopoda, vol. iv. part i. Supplement to the Recent, Tertiary, and Cretaceous sp., pp. 1–72, pls. i.–viii. Palæont. Soc. vol. xxvii.

Includes descriptions and figures of species which have been discovered since the Monograph was published, or concerning which fresh knowledge has been obtained. The author first notes the occurrence, habitat, &c. of 12 recent species which have been found in British seas. 2 species are next noted as occurring in the Post-Tertiary Clays of Scotland. Not a single new Brachiopod has been found in British Tertiary beds since the publication of the original monograph, 23 years ago. Mr. Davidson, however, gives additional information with respect to 9 Tertiary species. After a discussion of the improvements in the divisions of the British Cretaceous system as the result of the observations of many observers both at home and abroad, the author gives a full account of all the additional information which has been obtained with regard to the British Cretaceous Brachiopods. In addition to the 50 species described in the original monograph, the author now records the occurrence of 31 species, and 10 varieties since discovered. Most of these have been previously recorded; but *Waldheimia Walkeri, Rhynchonella Upwarensis, R. Cantabrigensis, R. Walkeri,* and *R. Speetonensis* are described as new. H. A. N.

——. Observations on the Genus *Porambonites.* Geol. Mag. dec. 2, vol. i. pp. 51–54, pl. iii.

Describes and figures the internal characters of shells of the genus. Concludes that the species of this genus form a small subfamily among the Brachiopoda, in which the shell was "attached, at least during a part of its existence, by means of a pedicle, or its representative. No calcified process is observable for the attachment or support of the oral appendages, which were no doubt fleshy and spirally coiled. There are also in the interior of each valve diverging dental and socket-plates, which laterally circumscribe the central muscular space. *Porambonites* differs materially from *Pentamerus* and other genera by its internal arrangements; nor is there any apparent ground why it should be located in the family *Rhynchonellidæ.*" H. A. N.

——. On the Tertiary Brachiopoda of Belgium &c. Geol. Mag. dec. 2, vol. i. pp. 150–159, plates vii., viii.

After a preliminary discussion of the subdivisions of the Belgian Tertiaries, the author enumerates the species of *Brachiopoda* which have been found in them. The following species have come under the author's observation:—1. From beds of the age of the Lower Pliocene —*Lingula Dumortieri, Terebratula grandis, Terebratulina caput-serpentis, Rhynchonella Nysti,* and *R. psittacea.* 2. From beds of the age of the Miocene—*Mannia Nysti, Discina Nysti,* and *Terebratulina ornata.* 3. From beds of the age of the Eocene—*Argiope Lefevrei, Terebratulina*

Kicksii, *T. bisinuata*, *Terebratulina Putoni*, and *Crania Nysti*. All the above-mentioned species are figured; and *Crania Nysti*, *Mannia Nysti*, and *Rhynchonella Nysti* are described as fully as the materials allow. Concludes with a short appendix on *Terebratula carneoides* and *Argiope Clevei*, from the Tertiary beds of St. Bartholomew, West Indies. Both species are figured; and the latter is described for the first time. H. A. N.

Davidson, Thomas, and Prof. William King. On the Trimerellidæ, a Palæozoic Family of the Palliobranchs or Brachiopoda. Quart. Journ. Geol. Soc. vol. xxx. pp. 124–173, pls. xii.–xix.

Begins with a bibliography of the Trimerellids. The next section deals with the nature of the internal parts of these Brachiopods; and section 3 is concerned with their myology, and with the characters of the hinge, pedicle, and other structures of the animal. Section 4 treats of the affinities of the *Trimerellidæ*, the authors coming to the conclusion that the family is most nearly related to the *Lingulidæ*, and that they belong to the *Inarticulata* (*Tretenterata*), in which the intestine ends in a distinct vent. Section 5 relates to the geological range, chronogenesis, and evolution of the family, all the species of which are found in the Cambro-Silurian (Lower Silurian) and Silurian (Upper Silurian) formations. Section 6 discusses the physiography of the seas tenanted by the Trimerellids as compared with that of the Cambrian seas; and in section 7 the authors give a diagnosis of the family. The remaining sections treat of the characters of the genera and species of *Trimerellidæ*. Three genera, viz. *Trimerella*, *Monomerella*, and *Dinobolus*, are recognized; and the following species are fully described and illustrated: — *Trimerella grandis* (Guelph Formation); *T. acuminata* (Guelph Formation); *T. Lindströmi* (U. Silurian of the Islands of Gotland and Farö); *T. Billingsii* (Guelph Limestones); *T.* (?) *Galtensis* (Guelph Formation); *T. Ohioensis* (Niagara Limestone of Ohio, and Guelph Limestones of Canada); *T. Dalli* (Guelph Formation); *T. Wisbyensis* (U. Silurian of Gotland); *Monomerella prisca* (Guelph Formation); *M. Walmstedti* (U. Silurian of Gotland and Farö); *M. Lindströmi* (U. Silurian of Gotland); *M. orbicularis* (Guelph Formation); *Dinobolus Conradi* (Upper part of Niagara Limestone); *D. Davidsoni* (Wenlock Limestone, Dudley); *D. Canadensis* (Black-River Limestone); *D. transversus* (Wenlock Limestone, Dudley); *D. Woodwardi* (Wenlock Limestone, Dudley); *D. magnificus* (Black-River Limestone); *D. Schmidti* (L. Silurian, Russia.) In an appendix the authors discuss the affinities of *Lingulops Whitfieldi* and *Chelodes Bergmani*. H. A. N.

Decock, —. Description des Inocérames de la Craie de Lezennes. [Descriptions of the *Inocerami* of the Lezennes Chalk.] Ann. Soc. Géol. Nord, 1870–74, pp. 82–84.

Seven species are described, the following being new :—*I. insulensis*, *I. Lezennensis*, *I. Gosseleti*, Moulle, near St. Omer. G. A. L.

Decock, —. Ammonites de la Craie de Lezennes. [Ammonites of the Lezennes Chalk.] Ann. Soc. Géol. Nord, 1870–74, p. 4.

Note of occurrence at Esquermes, Lille.

Derby, O. A. The Carboniferous Formation of South America. Amer. Nat. vol. viii. pp. 441, 442.

Notices the occurrence in the Carboniferous formation of the Amazons basin of Brachiopods, which prove the deposits to be of the age of the Coal Measures; also the occurrence of *Spirifera camerata* and *Retzia punctulifera* in a collection of Peruvian fossils. This indicates the occurrence of Carboniferous beds about 6° north of Lake Titicaca. H. A. N.

——. On the Carboniferous Brachiopoda of Itaituba, Rio Tapajos, Prov. of Pará, Brazil. Bull. Cornell Univ. no. 2, pp. 1–63, plates i.–ix.

The following new species are described:—*Terebratula Itaitubensis, Waldheimia Continlivana, Rhynchonella Pipira, Orthis Penniana, O. Morganiana, Streptorhynchus Correanus, S. Hallianus, S. Tapajotensis, Chonetes Amazonica, Strophalosia Cornelliana, Productus Chandlessii, P. Batesianus, P. Rhomianus, P. Wallacianus,* and *P. Clarkianus,* many other species being also noticed. Concludes with a "Comparison of the Carboniferous Brachiopod Fauna of South America with that of North America." Of 27 species described 12 occur in N. America, 8 of which are characteristic of Coal Measures; and the majority of the new species are more nearly allied to Coal-Measure forms than to any others. W. W.

Deslongchamps, Eug. Paléontologie Française. Terrain jurassique. —Brachiopodes, pp. 289–320, pls. 84–96.

In this continuation of the French Jurassic Brachiopoda the following new species are described:—*Terebrat.* (*Epithyris*) *provincialis,* from the Inf. Oolite of Provence, and *T.* (*Megerlea*) *Munieri,* from Fuller's Earth of La Voulte (Ardèche). Of the genus *Terebratula* 8 species are described in the text, and 4 others are figured in the plates, whose description will follow in the next part. E. B. T.

Dewalque, G. Rapport sur l'excursion de la Société Malacologique de Belgique à Couvin (partie paléontologique). [Excursion of the Malacol. Soc. to Couvin (Palæontological part)]. Ann. Soc. Mal. Belg. t. viii. Mém. pp. 77–83.

Lists of the fossils found are given.

Dumortier, Eug. Études paléontologiques sur les dépôts jurassiques du bassin du Rhône. [Palæontological studies on the Jurassic deposits of the Rhone basin.] Vol. iv. 8vo. Paris.

Dybowski, Magister W. N. Monographie der Zoantharia sclerodermata rugosa aus der Silur-Formation Estlands, Nord-Livlands und der Insel Gotland. [Monograph of the Silurian Rugose Corals of Esthonia, N. Livonia, and the Island of Gothland.] Arch. Naturk. Liv. Esth-Kurlands; Dorpat. natur. Gesell. Bd. v. 4 Lief., pp. 415–531, 3 plates of fossils (continuation).

The new species described in this part are:—*Cyathophyllum Rosenii, C. proliferum, C. siluricum, Campophyllum irregulare, Fascicularia dragmoides, Donacophyllum* (n. gen.) *Middendorffii, D. Lossenii, D. Schrenckii, Hallia tuberculata, Spongophyllum rectiseptatum, S. contortiseptatum, Microplasma* (n. gen.) *gotlandicum, M. Lovenianum, M. Schmidti, M. pectiniseptatum, Strephodes Keyserlingi.* These are figured, with others. G. A. L.

EDGELL, ARTHUR W. Notes on some Lamellibranchs of the Budleigh-Salterton Pebbles. Quart. Journ. Geol. Soc. vol. xxx. pp. 45–48, pls. iv.–vi.

Enumerates, figures, and in some instances describes various species, of which the following are new:—*Modiolopsis Lebesconti* and *Aviculopecten Tromelini.* Supports the view that the Budleigh-Salterton pebbles have been derived from Brittany and Normandy. H. A. N.

ERDMANN, EDW. Graptolith delvis omsluten af en svafelkisboll. [Graptolite enclosed in an iron-pyrites concretion.] Geol. fören. Stockholm Förhandl. Bd. i. pp. 204, 205, figs. 2, 3, pl. xviii.

The species is *Graptolithus sagittarius,* and in the specimen the stipe runs along the shale across the broken surface of an enclosed pyrites-ball. G. A. L.

ETHERIDGE, ROBERT, jun. On the Relationship subsisting between the *Echinothuridæ,* Wyville-Thomson, and the *Perischoechinidæ,* McCoy. Quart. Journ. Geol. Soc. vol. xxx. pp. 307–315, pl. xxiv.

After a consideration of the characters of the existing genera *Calveria* and *Phormosoma,* the author discusses the peculiarities of the Cretaceous genus *Echinothuria.* The Palæozoic genera *Archæocidaris, Palæchinus, Perischodomus, Lepidechinus, Eocidaris, Melonites,* and *Oligoporus* are next considered. The author concludes that the *Perischoechinidæ* constitute a distinct family, though related in some respects to the *Echinothuridæ.* This relationship is especially seen in the imbrication and overlapping of the plates of the ambulacral and interambulacral areas which occurs in the Palæozoic genera *Lepidechinus* and *Lepidesthes.* H. A. N.

——. Notice of Additional Species of Fossils from the Upper Silurian series of the Pentland Hills. Trans. Edin. Geol. Soc. vol. ii. part iii. pp. 309–313.

Names 14 species of fossils not previously recorded from this Silurian area. Of these, *Ambonychia* (?) *Hendersoni* and *Ctenodonta Pentlandica,* both from Bed D, near North Esk Reservoir, are described as new. H. A. N.

——. On the Remains of *Pterygotus* and other Crustaceans from the Upper Silurian Series of the Pentland Hills. Trans. Edin. Geol. Soc. vol. ii. part iii. pp. 314–316.

Draws attention to various fragmentary remains of *Pterygotus,* including an example of the egg-packets (*Parka decipiens*), and also to the tail-spines of *Ceratiocaris.* H. A. N.

Etheridge, Robert, jun. Notes on Carboniferous Lamellibranchiata (Monomyaria). Geol. Mag. dec. 2, vol. i. pp. 300–306, pl. xiii.

Describes and discusses the synonymy and affinities of the following species of *Lamellibranchiata* from the Carboniferous rocks of Scotland:—*Pecten Sowerbii*, *Aviculopecten oryza*, *A. ellipticus*, and *Posidonomya corrugata*. The author identifies *P. Sowerbii* with *P. Valdaicus* and *P. bathus*. Lists of localities are given for all the species. H. A. N.

——. Palæozoic Starfishes. Geol. Mag. dec. 2, vol. i. p. 432.

Refers to the occurrence of *Cribellites carbonarius* in sandstone of the Carboniferous Limestone Series at Shilbottle, near Alnwick.

——. Observations on *Chætetes tumidus*, Phillips. Ann. Nat. Hist. ser. 4, vol. xiii. pp. 194, 195, pl. xi. figs. 1–3.

Records the results of investigations on this species, and points out that the corallum often exhibits small areolæ, where there are only a few of the ordinary calices, or where there are only minute tubuli. The undoubted existence of tabulæ is also noted. H. A. N.

——. Observations on a few Graptolites from the Lower Silurian Rocks of Victoria, Australia, with a further Note on the Structure of *Ceratiocaris*. Ann. Nat. Hist. ser. 4, vol. xiv. pp. 1–10, pl. iii.

Records the occurrence of the following species:—*Tetragraptus bryonoides*, *T. quadribrachiatus*, *Phyllograptus typus*, *Loganograptus Logani*, *Climacograptus*, sp., *Diplograptus mucronatus*, *D. pristis*, *Didymograptus* (?) *fruticosus*, *D. nitidus*, *D. Pantoni*, *Graptolithus latus*, and *Graptolithus*, sp. Also notes his discovery of delicate gill-feet attached to the under-surface of the terminal and penultimate segments of the abdomen of *Ceratiocaris*, as seen in a specimen from the Upper Silurian of Lesmahagow. H. A. N.

Favre, E. Sur la classification des Ammonites. [Classification of Ammonites.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 353–355. Abstract.

The classification, of which a tabular abstract is given, is founded on the researches of Suess, Zittel, Keferstein, and Waagen. The Trigonellites is considered not an operculum, but an organ for the protection of nidimentary glands of the female Ammonite. The classification is based on this assumption and on the relative dimensions of the last chamber with reference to the presence or absence of the remarkable appendages which prolong the sides of the opening, and to the shape of the latter. These appendages are regarded as protecting the head and, more particularly, the eyes of the animal. G. A. L.

Fischer, P. Sur les fossiles des îles du Cap Vert, rapportés par M. Cessac. [Fossils of Cape-Verd Islands.] Compt. Rend. t. lxxviii. pp. 503–506.

The beds whence these fossils were obtained (in all the islands of the archipelago except Fogo) were supposed to be Tertiary by Darwin. The author, on palæontological grounds, believes them to be Quaternary. A list of the most common fossils is given, all of which (except the new species) now inhabit the neighbouring seas of the archipelago or of the west coast of Africa. The new species are *Pocillipora Cessaci* and *Clypeaster vulcani.* G. A. L.

Folin, Marquis de, and — Bérillon. Deux espèces nouvelles des Faluns de Cabane, près Dax. [Two new species from the Fahluns of Cabane, near Dax.] Proc.-Verb. Soc. Mal. Belg. t. iii. pp. ciii–cv.
The species described are *Cæcum fibratum* and *Meioceras Cabanensis.*

Foresti, L. Catalogo dei Moluschi Pliocenici delle colline Bolognesi, con una tavola. [Catalogue of the Pliocene Mollusca of the hills of Bologna.] Mem. Ac. Sci. Ist. Bologna, ser. iii. vol. iii.
The second part of the Catalogue, and comprises 108 species of Lamellibranchiata and 2 of Brachiopoda. In an appendix a number of Gasteropods are catalogued, which have been discovered since the publication of the first part. H. A. N.

Fuchs, Th. Petrefacte aus dem Schlier von Hall und Kremsmünster in Oberösterreich. [Fossils from the Marls of Hall and Kremsmünster in Upper Austria.] Verh. k.-k. Geol. Reichs. pp. 111–113.
Describes the fossils of the later Tertiary marls of the above localities. Amongst them is a new species, *Neæra Wolfi.*

——. Versteinerungen aus den oligocänen Nummuliten-Schichten von Polschitza in Krain. [Fossils from the Oligocene Nummulitic beds of Polschitza in Krain.] Verh. k.-k. geol. Reichs. pp. 129, 130.
Gives lists of fossils collected by Suess in these deposits, and concludes that they are of the same age as those of Oberburg.

——. Versteinerungen aus der Eocänbildungen der Umgebung von Reichenhall. [Fossils from the Eocene formations of the neighbourhood of Reichenhall.] Verh. k.-k. geol. Reichs. pp. 132–135.
Gives full lists of fossils from these deposits.

Gaudry, Albert. Les êtres des temps primaires. [Palæozoic fossils.] Paris. Pp. 1–20, 8vo. See also Rev. Sci. pp. 993–997.
A syllabus of the first part of the Palæontological course delivered at the Museum of Natural History, Paris. A sketch of the divisions of the Palæozoic rocks, and notices of their chief fossils. G. A. L.

Geinitz, Dr. Hans Bruno. Das Elbthalgebirge in Sachsen—der untere Quader. [Gasteropoda from the Lower Quader in the Elbe valley.] Palæontographica, Bd. xx. Abth. i. Lief 7 (Gastropoden), pp. 239–276, pls. liii.–lx.
The Gasteropods from the L. Quader or Cenomanian of the Elbe valley in Saxony are here described, to the number of 112. Many of these occur at Blackdown (Devon), and some as far away as India. The

following are described for the first time:—*Turritella subparallela*, *T. Kirsteni*, *Euchrysalis Stoliczkai*, *E. Laubeana*, *Neritopsis torulosa*, *Nerita ovoides*, *N. minutissima*, *Pileolus capillaris*, *P. plicatus*, *Littorina minuta*, *Phasianella Beyrichii*, *Trochus Fischeri*, *Turbo scobinosus*, *T. Naumanni*, *T. Leonhardi*, *T. Plauensis*, *Solarium Kirsteni*, *S. Zschaui*, *S. Reussi*, *S. Ackermanni*, *Straparollus Roemeri*, *Teinostoma Stoliczkai*, *Stelzneria cepacea* (new genus), *Patella Plauensis*, *P. radiolitarum*, *Fasciolaria distincta*, *Neptunea paupercula*, *N. misera*, *N. loricata*, *Rapa audacior*, *R. Corneti*, *R. Briarti*, *R. Malaisi*, *Murex armatus*, *Trophon electum*, *Tritonium robustum*, *Columbella insignis*, *C. clathrata*, *Cancellaria minima*, *C. ovulum*, *Nerinæa Cottai*, *Cerithium Guentheri*, *C. Peschelianum*, *C. Toermerianum*, *C. Fischeri*, *C. acus*, *C. Margaretæ*, *C. bizonatum*, *C. æquale*, *C. Heberti*, *C. intermixtum*, *C. Fritschei*, *C. heterostoma*, *C. Sturi*, *C. difficile*, *C. infibulatum*, *C. Schlüteri*, *C. subvagans*, *C. Barrandei*, *C. conversum*, *C. Hübleri*, *C. Rudolphi*, *C. macrostoma*, *C. Strombecki*, *C. interpunctatum*, *C. Gümbeli*, *C. Lorioli*, *Actæon obscurus*, *A. Braunsi*, *A. Boelschei*, *Trochactæon Stelzneri*. All these are from Plauen, a few occurring at Koschütz, near Dresden. E. B. T.

GEINITZ, Dr. HANS BRUNO. Das Elbthalgebirge in Sachsen. Palæontographica, Bd. xx. Abth. i. Lief. 8, pp. 277–314, pls. 61–67.

Describes and figures Cephalopoda, Annulata, Cirripedia, Entomostraca, Fish, Reptiles, and Plants from the L. Quader of the Elbe valley in Saxony. F. W. R.

——. Das Elbthalgebirge in Sachsen—ii. Theil. Der mittlere und obere Quader. [Gasteropoda and Cephalopoda from the Middle and Upper Quader in the Elbe valley.] Palæontographica, Bd. xx. Abth. 2, Lief. 5 (Gasteropoden and Cephalopoden), pp. 161–198, pls. 29–36.

The Gasteropods and Cephalopods from the M. and U. Quader are 62 in number; 4 were fully described in the first part (containing description of L. Quader fauna). The M. Pläner (L. Turonian) beds give 9 species, some of which pass up; the Plänerkalk (U. Turonian) gives 37 species, among which *Trochus Engelhardtii* and *T. Steinlai* from Strehlen are new; the Baculitenmergel (L. Senonian) contributes 12 species, among which *Neptunea modesta* and *Cancellaria Thieneana* are new. Many occur also in the Plänerkalk. Comparing these lists with those of other lands, a large number are found in the Cretaceous of Bohemia, many in the English Chalk and Chloritic Marl, and some in India. E. B. T.

GÜMBEL, Dr. C. W. *Gyroporella* oder *Diplopora*? Verh. k.-k. geol. Reichs. pp. 235, 236.

Relates to the differences which the author believes to subsist between *Diplopora* and *Gyroporella*, and which he believes to be of generic value. [See under MOJSISOVICS, p. 315.] H. A. N.

——. Ueber neue Gyroporellen aus dem Gailthaler Gebirge. [New species of *Gyroporella* from the Gailthaler.] Verh. k.-k. geol. Reichs. pp. 79, 80.

Notices the occurrence of *Gyroporella ampleforata* in the Permian formation of Pontafel, associated with numerous *Foraminifera.*

GÜMBEL, Dr. C. W. N. Jahrb. Heft 1, pp. 68–70.

Letter announcing 1. the discovery of a large number of species of *Ostracoda* between the valves of a *Megalodon cucullatus* from *Stringocephalus*-limestone of Pfaffrath, in the Eifel; 2. the formation of the genus *Petrascula* for the reception of some large Foraminifera; 3. the discovery of a *Gyroporella* (*G. ampleforata*) in the Alpine Carboniferous Limestone of Pontafel. F. W. R.

GUPPY, R. J. L. On the West-Indian Tertiary Fossils. Geol. Mag. dec. 2, vol. i. pp. 404–412, 433–446, pls. xvi.–xviii.

Describes and figures a number of Mollusca from the Eocene, Miocene, and Pliocene deposits of the West Indies. Concludes with a list of the Mollusca, Articulata, Echinodermata, and Protozoa found in these deposits. Amongst the species described the following are new:—*Ringicula tridentata*, *Naticina regia*, *Bulla Vendryesiana*, *Cancellaria scalatella*, *Ovulum immunitum*, *Purpura Miocenica*, *Fasciolaria textilis*, *Phos erectus*, *Planaxis crassilabrum*, *Strombus pugiloides*, *Murex collatus*, *Ancillaria pinguis*, *Cassis reclusa*, *Monodonta basilea*, *Venus Blandiana*, *Chama involuta*, *Plicatula vexillata.* H. A. N.

HAAST, Dr. J. Vorkommen von Brachiopoden an den Küsten von Neu-Seeland. [Brachiopods of the coasts of New Zealand.] Verh. k.-k. geol. Reichs. pp. 253–255.

A letter giving an account of the Brachiopods which he has met with on these coasts, and concluding that they are in the main inhabitants of shallow water, so far as the fossil forms are concerned. H. A. N.

HAECKEL, ERNST. Ueber eine sechszählige fossile Rhizostomee und eine vierzählige fossile Semæostomee. [Fossil Medusæ.] Jen. Zeitsch. Naturwiss. Bd. viii. pp. 308–330, 2 plates (fossils), 2 woodcuts (restorations).

In previous papers the author has described 12 species of fossil Medusæ. He now describes two new genera and species as *Hexarhizites insignis* and *Semæostomites Zittelii*. Both belong to the group *Discophora*—the former to the *Rhizostomata*, and the latter to the *Semæostomata.* The fossils were obtained from the lithographic slate of Pappenheim in Bavaria. F. W. R.

HALL, Prof. JAMES. Description of new species of Crinoidea and other fossils from strata of the age of the Hudson-River group and Trenton Limestone. 24th Ann. Rep. S. C. New York, pp. 205–224, pls. v.–viii. [dated 1872, but seems not to have been published till 1874].

[Stated to have been published in greater part in 1866, as advance sheets of the 20th Rep. It did not appear in that Rep., and it is presumed that it was only *privately* circulated. The paper is also stated to have been reissued in 1871, with some additions; but the circulation of the reissue seems also to have been private. The paper seems, therefore, not to have been accessible to the public till 1874.] The following species are described and illustrated from the Hudson-River group of Ohio, Wisconsin, and Kentucky, mostly from the vicinity of Cincinnati and Lebanon, Ohio:—*Glyptocrinus Nealli*, *G. parvus*, *Poteriocrinus* (*Dendrocrinus*) *caduceus*, *P. posticus*, *Heterocrinus constrictus*, *H. laxus*, *H. juvenis*, *Heterocrinus?* (*Iocrinus*) *Polyxo*, *H. exilis*, *Agelacrinus* (*Lepidodiscus*) *Cincinnatiensis*, Roemer, *A. pileus*, *A. verticillatus*, *A.* (*Hemicystites*) *stellatus*, *Lichenocrinus Dyeri*, *L. crateriformis*, *Crania scabiosa*, *C. Lœlia*, *Trematis millepunctata*, *T. pustulosa*, *Dalmania breviceps*, and *Proetus parviusculus*. From beds of Trenton Limestone age the following fossils are described:—*Cyclocystoides Salteri*, *C. anteceptus*, *Crania Trentonensis*, *C. setigera*, and *Pholidops Trentonensis*.

H. A. N.

Hall, Prof. **James**. Descriptions of new species of fossils from the Hudson-River group in the vicinity of Cincinnati, Ohio. 24th Ann. Rep. S. C. New York, pp. 225–232, pls. vii. & viii. [published in advance in 1871; but its circulation appears to have been private.]

The following species are described and figured in this paper:—*Leptobolus lepis*, *L. occidentalis*, *L. insignis*, *Lyrodesma Cincinnatiensis*, *Tellinomya pectunculoides*, *Fusispira ventricosa* (Trenton), *F. elongatus* (Trenton), *F. terebriformis*, *Cyrtolites Dyeri*, *Leperditia* (*Isochilina*) *cylindrica*, *L.* (*Isochilina*) *minutissima*, *Beyrichia tumifrons*, and *B. oculifera*. The genus *Leptobolus* is proposed for certain minute Linguloid shells which occur in the Hudson-River group and Utica Slates. The ventral valve has a distinct area and pedicel-groove, with an elevated subquadrate muscular area; the dorsal valve has slightly elevated trifid muscular impressions. The genus *Fusispira* is proposed for certain Gasteropods which have the general form of *Fusus* and *Subulites*, but differ from the former in the much less twisted columella, and from the latter in not being truncate at the base of the columella, and in being destitute of a deep anterior notch. The species of the genus are confined to the Trenton and Hudson-River formations.

H. A. N.

——. Descriptions of Bryozoa and Corals of the Lower Helderberg Group. Printed May 1874, in advance of Rep. on State Museum, pp. 93–115.

Describes the following new species of Corals and Polyzoa from the Lower Helderberg formation of N. America:—*Fenestella nervia*, *F. præcursor*, *F. crebripora*, *F. Idalia*, *F. sylvia*, *Polypora Lilia*, *P. elegans* (?), *Hemitrypa prima*, *Ichthyorachis Nereis*, *Escharopora tenuis*, *E. nebulosa*, *E. lirata*, *Callopora Hyale*, *C. macropora*, *C. venusta*, *C. unispina*, *C. perelegans*, *C. heteropora*, *C. ponderosa*, *Trematopora rhombifera*, *T. signata*, *T. constricta*, *T. corticosa*, *T. densa*, *T. ponderosa*, *T. maculosa*, *T. regularis*, *Paleschara incrustans*, *P. bifoliata*, *Ceramopora maculata*, *C.* (*Berenicea*) *maxima*, *Vermipora serpuloides*, *Aulopora Schohariæ*,

Chætetes Helderbergiæ, *C. sphærica*, *Favosites Helderbergiæ*, *F. conica*, *F.? minima*, *Michelinia lenticularis*, *Striatopora Issa*, and *Streptelasma* (*Petraia*) *stricta*. The genus *Paleschara* is proposed for certain *Polyzoa* which may be parasitic or free, and which are composed of polygonal cells with thin solid walls, and without septa or tabulæ. The genus *Vermipora* is proposed for certain *Polyzoa* composed of ramose branches formed by the union of serpula-like tubes cemented upon each other, and the apertures of which are directed upwards, and open on the side of the branch. The tubes are without septa or tabulæ. H. A. N.

Hall, Prof. James. Descriptions of New Species of Goniatidæ, with a list of previously described Species. Printed May 1874, in advance of the 27th Report on the State Museum of Natural History, pp. 4.

In this communication the author describes the following new species or varieties of *Goniatites* from the Devonian rocks of North America:—*G. complanatus*, var. *perlatus* (Chemung group?); *G. unilobatus* (Hamilton group); *G.* (*Clymenia?*) *Nundaia* (Portage and Chemung groups); *G. simulator* (Chemung group); and *G. Chemungensis*, var. *æquicostatus* (Chemung group). H. A. N.

——, and R. P. Whitfield. Descriptions of New Species of Fossils from the Devonian Rocks of Iowa, &c. 23rd Ann. Rep. S. C. N. York, pp. 223–243, pls. ix.–xiv. [Dated 1873, but apparently not published till 1874. The final paper, "Notes on some New or Imperfectly-known Forms amongst the Brachiopoda," &c., was printed and circulated in 1871, and is not abstracted in the present place.]

The authors describe and illustrate the following new species from the Devonian deposits of Iowa, some of these deposits being of Corniferous Limestone (Upper Helderberg) age, others being apparently the equivalent of the Hamilton Formation, and others being identified with the Chemung group. The *Protozoa* are represented by *Stromatopora erratica*, *S. expansa*, *S.* (*Cœnostroma*) *incrustans*, *S.* (*Cœnostroma*) *solidula*, and *Caunopora planulata*. The corals are represented by *Fistulipora occidens*, *Alveolites Rockfordensis*, *Cladopora prolifica*, *C. magna*, and *C. palmata*, *Zaphrentis solida*, *Pachyphyllum Woodmani*, *P. solitarium*, *Campophyllum nanum*, *Chonophyllum ellipticum*, *Acervularia inæqualis*, *Smithia Johanni*, *S. multiradiata*, *Cystiphyllum mundulum*, *Aulopora saxivada*, and *A. Iowensis*. The species of *Pachyphyllum* are the first of the genus recognized in America. It is noticeable also that the occurrence of mural pores is now for the first time recognized in *Cladopora*, which would apparently justify the view that *Cladopora* is really founded upon ramose species of *Favosites*. The *Polyzoa* (?) are represented by one form only, viz. *Stomatopora* (*Alecto*) *alternata*. The new Brachiopods are *Crania famelica*, *Spirifera Orestes*, *S. subvaricosa*, *S. cyrtinaformis*, *Cryptonella Calvini*, *Strophopodonta Canace*, and *S. hybrida*. Two species of *Gasteropoda* are described—*Pleurotomaria Isaacsii* and *Naticopsis gigantea*.

The Report further contains the following supplementary notices:—

1. "Notice of three New Species of Fossil Shells from the Devonian of Ohio." These are *Leiorhynchus Newberryi*, *Naticopsis cretacea*, and *Porcellia Sciota*—the first from the Chemung group, the last two from the Upper Helderberg Limestone. *Palæoneilo parallela* is also described as a new species from the Waverley Limestone of Ohio. 2. "Notice of Two New Species of Fossil Shells from the Potsdam Sandstone of New York." The genus *Palæacmæa* is proposed for a small Patelloid shell, more or less allied to *Metoptoma*, but wanting the truncated anterior margin of this genus; and the single species *P. typica* is described. A new species of *Hyolithes* is also described (*H. gibbosus*). 3. "Supplement." Describes two new species of *Trematis* (*T. punctostriata* and *T. rudis*), both from hydraulic limestones of the age of the Trenton Limestone at Clifton, Tennessee. Both are figured.
H. A. N.

HALL, Prof. JAMES, and R. P. WHITFIELD. Descriptions of New Species of Fossils from the vicinity of Louisville, Kentucky, and the Falls of the Ohio. 24th Ann. Rep. S. C. N. York, pp. 181–200 *a*. [Dated 1872, but apparently published in 1874.]

Contains descriptions, without figures, of the following new species, from beds of Niagara-Limestone (U. Silurian) age from Louisville and the Falls of the Ohio:—*Dictyonema pergracilis*, *Orthis nisis*, *O. rugæplicata*, *Spirifera rostellum*, *Pentamerus Knappi*, *P. Nysius*, *Murchisonia petila* (M. Silurian), *Euomphalus* (*Cyclonema*) *rugælineata*, and *Illænus cornigerus*. The following new species and varieties are described from the Devonian of Kentucky and Indiana:—*Crania Bordeni*, *Aviculopecten crassicostatus*, *Cardiopsis crassicosta*, *Lucina* (*Paracyclas*) *elliptica*, var. *occidentalis*, *Cypricardinia inflata*, var. *subæquivalvis*, *Cypricardinia? cylindrica*, *Yoldia? valvulus*, *Nucula niotica*, *Nucula neda* *Tellinomya subnasuta*, *Ptychodesma Knappiana*, *Polyphemopsis Louisvillæ*, *Loxonema hydraulica*, *Trochonema emacerata*, *T. rectilatera*, *T. Yandellana*, *Pleurotomaria Estella* [not *Murchisonia Estella*, Bill.], *P. imitator*, and *Bucania Devonica*. The new genus *Ptychodesma* is proposed for certain modioloid bivalves, with equally convex valves, the hinge "with a wide ligamental area, the sides of which are sharply grooved in parallel lines, caused by the successive growth of the ligament, as in *Pectunculus*." A list of fossils from the Falls of Ohio, the vicinity of Jeffersonville, Indiana, and the neighbourhood of Louisville, Kentucky, is given, but only includes the *Crinoidea*, *Brachiopoda*, *Lamellibranchiata*, *Gasteropoda*, *Cephalopoda*, and *Trilobita*. Finally a supplementary note describes as new, under the name of *Pentamerus nucleus*, a small Brachiopod from the Clinton group of Louisville, Kentucky, which had previously been cited as *P. galeatus*. H. A. N.

HARGER, O. Notice of a new Fossil Spider from the Coal Measures of Illinois. Amer. Journ. ser. 3, vol. vii. pp. 219–223.

Arthrolycosa antiqua is described as n. gen. and sp. from the lower part of the true Coal Measures. The palpus seems chelate, but the state of preservation makes this doubtful; there is a pit on the cephalothorax; and the abdomen is segmented. The fossil is not placed with the true spiders, but, from its affinities to the false scorpions &c., it is supposed that it may be an embryonic type. E. B. T.

Henderson, John. On some Silurian Fossils found in the Pentland Hills. Trans. Edin. Geol. Soc. vol. ii. part iii. pp. 373–375.

Notes the occurrence in U. Silurian rocks of several forms new to this area.

——. Notice of some Fossils from the conglomerate at Habbie's Howe, Logan Burn, near Edinburgh. Trans. Edin. Geol. Soc. vol. ii. part iii. pp. 389, 390.

Records the discovery of undetermined species of *Orthis, Strophomena, Halysites*, and *Favosites*, probably of Silurian age.

Hörnes, R. Fossilien aus Bessarabien u. d. Krimen. [Fossils from Bessarabia.] Verh. k.-k. geol. Reichs. pp. 65, 66.

Describes collections of fossils from the Sarmatian deposits and "Congeria Shales" of Bessarabia, and concludes that the so-called "Valenciennesia Shales" belong to the Lower portion of the "Congeria Shales." A number of new Mollusks are named, but their description is deferred. H. A. N.

——. Ueber Neogenpetrefacte aus Croatien und Südsteiermark. [On fossils from the Neogen of Croatia and Südsteiermark.] Verh. k.-k. geol. Reichs. pp. 147, 148.

——. Ein Beitrag zur Kenntniss der "Congerien-Schichten" (*Cardium acardo*, Desh., aus Brauneisenstein von Csetnek in Gomörer Comität). [Contribution to the knowledge of the "Congeria-beds" (*Cardium acardo*, Desh., from brown iron-ore from Csetnek.)] Verh. k.-k. geol. Reichs. pp. 269-271.

Records additional fossils from the "Congeria-beds" of Hungary, and amongst them *Cardium acardo*.

——. Ueber Tertiärconchilien aus dem Banat. [Tertiary shells from the Banat.] Verh. k.-k. geol. Reichs. pp. 387–390.

Gives lists of a collection of Mollusca from the "Mediterranean," "Sarmatian," and "Congeria"-beds, and a general account of the deposits whence the specimens were obtained. A new species is noted under the name of *Congeria Banatica*. H. A. N.

——. Tertiaër-Studien. [Tertiary-studies.] Jahrb. k.-k. geol. Reichs. Bd. xxiv. Heft 1, pp. 33-80, with 4 plates (fossils).

The following new fossils are described from Kischineff in Bessarabia:—*Phasianella Bayerni*, *P. Sarmatica*, *Melania Fuchsii*, *Capulus Kischineræ*. They are from beds of Sarmatic age. 28 other species are noted. A collection of fossils from near Kertch, from beds of the same age, contained one new species (*Cardium Barboti*) and 8 others: it is noted that *Tapes gregaria* has been made into 3 new species in 2 different genera. From the Valenciennesia-beds near Kertch another new species is described, *Cardium Abichi*; from Beocsin, *Cardium*

Lenzi and *C. Syrmiense* are also new. From the Congeria-beds near Kertch the new species noted are *Mactra globula*, *Cardium Tamanense*, *C. Panticapæum*, *C. subpaucicostatum*, *C. Bayerni*, which occur with 21 others. E. B. T.

Hopkinson, John. On some Graptolites from the Upper Arenig Rocks of Ramsey Island, St. Davids. Proc. Liverpool Geol. Soc. Session 15, pp. 47–50. [Brit. Assoc.]

Believes, from the abundance of dendroid forms of Graptolites in the Lower Arenig rocks, that it is improbable that they are contemporaneous with the Skiddaw Slates, which are probably newer. C. E. De R.

Houzeau de Lehaye, Aug. Liste des Bryozoaires du Poudingue de Ciply. [List of the Bryozoa of the Conglomerate of Ciply.] Ann. Soc. Mal. Belg. t. viii. Mém. pp. 36–38.

A preliminary list of 164 species, of which 46 are undetermined species of known genera, and 3 are species of probably a new genus allied to *Biflustra*. G. A. L.

Hyatt, Prof. A. Evolution of the Arietidæ. Proc. Nat. Hist. Soc. Boston, vol. xvi. pt. 2, pp. 166–170.

In these notes on the evolution of one group of Ammonites, the author attempts to trace a genetic relation between different subgenera. He does not adopt the divisions of European palæontologists, claiming priority for his own names. *A. (Psiloceras) planorbis* is considered the parent form; from this species diverge in lines forming a genealogical tree. The old-age changes seen in *Psiloceras* are very slight; they become more distinct in *Caloceras* and succeeding series; and in the last members of the series of *Coroniceras* they seriously affect the entire form of the adult: in *Asteroceras Collenotii* the adult has the same form as the old *Coroniceras trigonatum*. E. B. T.

James, U. P. Descriptions of New Species of Brachiopoda from the Lower Silurian Rocks—Cincinnati group. Cincin. Quart. Journ. Sci. vol. i. pp. 19–22.

Gives descriptions of three species of Brachiopods from the Cincinnati group of Ohio—*Orthis cyclus* (related to *O. emacerata* and *O. multisecta*), *O. crassa*, comprising the form doubtfully described (by Mr. Meek) under the name of *O. dentata*, owing to a mistake in the specimens submitted for examination, and *O.* (?) *Morrowensis*. H. A. N.

——. "Nullipores." Cincin. Quart Journ. Sci. vol. i. pp. 153, 154.

Draws attention to the occurrence of certain enigmatical bodies, forming crusts upon corals, crinoidal columns, &c., in the Cincinnati group, and suggests that they may perhaps be of the nature of *Nullipores.* H A. N

——. Descriptions of New Species of Fossils from the Lower Silurian Formation—Cincinnati group. Cincin. Quart. Journ. Sci. vol. i. pp. 239–242.

Describes the following new species from the Cincinnati group—*Avicula corrugata*, *A. Welchi*, *Streptorhynchus* (*Strophomena*) *elongatus*, *Strophomena declivis*, and *Streptorhynchus* (*Strophomena*) *vetustus*. The last is allied to *Strophomena subtenta*. H. A. N.

James, U. P. Descriptions of New Species of Brachiopoda from the Lower Silurian Formation, Cincinnati group. Cincin. Quart. Journ. Sci. vol. i. pp. 333–335.

Describes the following species of Brachiopoda from the Cincinnati group:—*Strophomena gibbosa*, regarded by Mr. Meek as a variety of *S. rhomboidalis*, and as being identical with *S. tenuistriata*; but the author regards all three as distinct species, and points out that each holds a definite geological horizon; and *S. squamula*. H. A. N.

——. Descriptions of one New Species of *Leptæna* and two species of *Cyclonema* from the Lower Silurian Rocks—Cincinnati group. Cincin. Quart. Journ. Sci. vol. i. pp. 151–153.

Describes a *Leptæna* (*L. aspera*=*L. sericea*?) and two *Cyclonemæ* (*C. pyramidata* and *C. fluctuata*) allied to *C. bilix*. The last is the same as *C. bilix*, var. *lata*. H. A. N.

Jeffreys, J. G. Some Remarks on the Mollusca of the Mediterracean. Rep. Brit. Assoc. for 1873, 8vo. pp. 111–116.

The paper gives (p. 116) a list of 26 species which are fossil in Sicily, and which have been found living in the Mediterranean.

Johnson, Hawkins M. On the Microscopic Structure of Flints and allied bodies. Journ. Quekett Micros. Club, vol. iii. pp. 234–237, plate 9; and privately printed, 8vo. Lewes?

By treating with acids thin plates of flint, iron-pyrites, nodules from the Chalk, septaria from the London and Kimmeridge Clays, and phosphatic nodules from the Gault and Cambridge deposit, the author has succeeded in developing delicate structures, which he believes to be of organic origin, and which in appearance suggest the group of the sponges. E. T. N.

Jones, Prof. T. Rupert. Notes on some Silurian Entomostraca from Peebleshire. Geol. Mag. dec. 2, vol. i. pp. 511, 512; reprinted, with woodcut added, and correction, from Trans. Edin. Geol. Soc. vol. ii. part 3, pp. 321, 322.

Describes and figures the following Ostracoda—*Beyrichia impendens*, *Entomis aciculata*, *Primitia protenta*, and *Bairdia* (?) *Browniana*. The last two species are described for the first time. H. A. N.

——. New locality for *Leaia*. Geol. Mag. dec. 2, vol. i. p. 480.

Notes the discovery of *Leaia* in ironstone at the lower part of the Coal Measures of Fifeshire.

——. [Entomostraca]. Jahrb. Heft 2, p. 180.

Letter stating that the so-called *Cypridinæ* of the German "Cypridinenschiefer" belong neither to *Cypridina* nor to *Entomis*, but form a new genus, which he names *Richteria*. They are not bivalved. Probably Richter's *Cytherina striatula* belongs to a new genus, whilst his *Beyrichia dorsalis* is not a *Beyrichia*, but probably a *Primitia*, similar to *P. Maccoyi*,. To judge from Richter's figure, his *Beyrichia nitidula* resembles some of the Cytheroids from the Scotch Coal Measures. F. W. R.

JONES, Prof. T. RUPERT, and W. KIRKBY. Monograph of the British Fossil Bivalved Entomostraca from the Carboniferous Formations. Part I. The Cypridinadæ and their Allies. Palæont. Soc. pp. 1–56, pls. i.–v.

The authors commence with a review of the families and genera of the *Ostracoda*, with more especial reference to the *Cypridinadæ* and allied groups, followed by a synopsis of the genera and species of the *Cypridinadæ*, *Conchœcidæ*, *Entomoconchidæ*, and *Polycopidæ*. The rest of the monograph describes the Carboniferous genera and species. The following genera are defined—*Cypridina*, *Cypridella*, *Cyprella*, *Bradycinctus*, *Philomedes*, *Entomoconchus*, *Polycope*, *Cypridinella*, *Cypridellina*, *Sulcuna*, *Rhombina*, and *Offa*, of which the last five are new. Besides previously recorded forms, the monograph contains descriptions of the following new species—*Cypridina radiata*, *C. Wrightiana*, *C. Bradyana*, *C. brevimentum*, *C. Youngiana*, *C. Hunteriana*, *C. pruniformis*, *C. oblonga*, *Cypridinella Cummingii*, *C. superciliosa*, *C. clausa*, *C. Bosqueti*, *C. Maccoyiana*, *C. monitor*, *C. vomer*, *Cypridellina clausa*, *C. Burrovii*, *C. intermedia*, *C. elongata*, *C. galea*, *C. vomer*, *C. alta*, *C. Bosqueti*, *Cypridella obsoleta*, *C. Wrightii*, *C. quadrata*, *C. cyprelloides*, *Sulcuna lepus*, *S. cuniculus*, *Philomedes Bairdiana*, *Rhombina Hibernica*, *R. Belgica*, *Entomoconchus orbicularis*, *E. globosus*, *Offa Barrandiana*, and *Polycope Burrovii*. H. A. N.

KARRER, F. Die Conchylienführung der Sandschichten in Vozlau. [Mollusca of the Arenaceous beds of Vozlau.] Verh. k.-k. geol. Reichs. pp. 288, 289.

Gives a list of the predominant Gasteropods and Lamellibranchs noticed in the above-mentioned Tertiary deposits.

KAYSER, E. Notiz über eine auffällige Missbildung eines devonischen Gomphoceras. Zeitsch. deutsch. geol. Gesell. Bd., xxvi. Heft. 4, pp. 671–674, with a plate.

Describes and figures an abnormal form of a Devonian *Gomphoceras* from Bicken, near Herborn, in Nassau.

KING, Prof. WILLIAM, and T. H. ROWNEY. Remarks on the subject of "Eozoön." Ann. Nat. Hist. ser. 4, vol. xiii. pp. 390–396.

Mainly a summary of the chief grounds upon which the authors have been led to conclude that *Eozöon Canadense* is of a mineral nature. H. A. N.

——— ———. "Eozoön" examined chiefly from a Foraminiferal Standpoint. Ann. Nat. Hist. ser. 4, vol. xiv. pp 274–289, pl. xix.

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A summary and recapitulation of the more important points which appear to militate against a reference of *Eozoön Canadense* to the *Foraminifera*. H. A. N.

Koninck, Prof. L. de. Palæozoische Fossilien aus Australien. [Palæozoic fossils from Australia.] Verh. k.-k. geol. Reichs. p. 31.

Note on a collection of Silurian, Devonian, and Carboniferous fossils from Australia.

Lapworth, Charles. Notes on the Graptolites discovered by Mr. John Henderson in the Silurian Shales of Habbies' Howe, Pentland Hills. Trans. Edin. Geol. Soc. vol. ii. part iii. pp. 375–377.

Notes the occurrence of *Monograptus colonus*, *M. priodon*, *M. Flemingii*, *Cyrtograptus Scoticus* (M.S.), *Retiolites Geinitzianus*, and *Dictyonema assimilis* (= *Fenestella assimilis*, Lonsdale.) H. A. N.

——. On the Diprionidæ of the Moffat Shale. (Abstract.) Proc. Geol. Assoc. vol. iii. No. 4, pp. 165–168.

The Moffat Shale (L. Silurian) is probably the oldest formation of the South of Scotland, and consists of about 600 feet of shales and mudstones abounding in Graptolites, especially of the family *Diprionidæ*. The specimens of *Climacograptus* preserved in relief show that Prof. Nicholson's view of the duplicate nature of the polypary is substantially correct. A polypary with the external features of Prof. Hall's *Climacograptus* has the internal structure of *Diplograptus*. The paper concludes with a classification of the family *Diprionidæ*. W. W.

Lefèvre, T. 1. Un Gastéropode nouveau pour la faune Laekénienne supérieure. 2. Un Lamellibranche nouveau pour la faune Laekénienne inférieure. [A new Gasteropod for the Upper, and a new Lamellibranch for the Lower Laekenian fauna.] Proc. Verb. Soc. Mal. Belg. pp. 208, 209.

The species are *Fusus subscalarinus*, U. Laekenian, Wemmel, and *Tellina rostralis*, found in the *Nummulites-variolaria* zone at Forest, near Brussels, L. Laekenian. G. A. L.

——. Une anomalie observée chez le *Pecten corneus*, Sow. [An anomaly observed in *Pecten corneus*.] Ann. Soc. Mal. Belg. t. viii. Mém. pp. 73–76, 1 plate.

This shell is found in Belgium in the Upper Ypresian Sands and in the Laekenian, but is not known in the intervening Bruxellian system. The anomaly noticed consists in a kind of squamous extension of the outer lips of the valves of the shell. G. A. L.

Leslie, Harry. Local Natural History Notes, No. 1. Bussage, near Stroud, Gloucestershire. Science Gossip, No. 119, p. 244.

Contains a short notice of common Oolitic fossils.

Leymerie, —. Sur la nécessité de conserver, au moins au point de vue géologique, les Gryphées et les Exogyres. [The necessity, from a geological point of view, of preserving the genera *Gryphæa* and *Exogyra*.] Bull. Soc. Geol. France, 3 sér. t. ii. pp. 141–145.

Insists that to merge the *Gryphææ*, which indicate the Jurassic ages, and the *Exogyræ* which denote the supra-Jurassic rocks, into the genus *Ostrea* would be very unfortunate for geologists, without contesting the correctness of the connexion established by conchologists. G. A. L.

Lindström, G. Förteckning på siluriska koraller från Jemtland, samlade af Dr. G. Linnarsson. [Silurian corals from Jemtland.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 90–93.

Six species of Tabulate corals, and 3 of Rugose are named.

Linnarsson, G. Försteningar från Lappland, insamlade af Hrr. E. Sidenbladh och E. Erdmann. [Fossils from Lapland.] Geol. fören. Stockholm Förhandl. bdt. ii. pp. 129–131.

The species recognized were *Ceratopyge forficula*, *Euloma ornatum*, *Symphysurus socialis*, *Agnostus Sidenbladhi*, *A. punctuosus*, and *A. fallax*. G. A. L.

——. Trilobiter från Westergötlands "Andrarumskalk." [Trilobites from the "*Andrarum* limestone" of W. Gothland.] Geol. fören. Stockholm Förhandl. bdt. i. pp. 242–248. G. A. L.

9 species are named.

Loriol, P. de, and E. **Pellat**. Monographie géologique et paléontologique des étages supérieurs de la Formation Jurassique de Boulogne-sur-mer. I. Partie. Mollusques, Céphalopodes, et Gastropodes. [Geological and Palæontological Monograph of the upper stages of the Jurassic formation of Boulogne-sur-mer Part I. Cephalopoda and Gasteropoda.] Mém. Soc. Phys. et Hist. Nat. Genève, vol. xxiii. pp. 155, with ten plates of fossils.

Describes the *Cephalopoda* and *Gasteropoda* of the Jurassic deposits of Boulogne, and some remains of *Serpula* and *Pollicipes*.

Lundgren, B. Om en *Comaster* och en *Aptychus* från Köpinge. [A *Comaster* and an *Aptychus* from Köpinge, Scania.] Öfversigt K. S. Vet. Akad. Förhandl. No. 3.

Lütken, Chas. Description du *Cladangia exusta*, espèce moderne d'un genre de coraux connu jusque'ici seulement comme fossile miocène. [Description of a recent species of *Cladangia*, a genus hitherto only known fossil.] Journ. Zool. vol. iii. pp. 321–324.

The specimen was probably from the Indian Ocean, and belongs to a genus known hitherto only in the Miocene. It is specifically distinct from *Cladangia semisphærica*, Defr., and *Cl. conferta*, Reuss, and is called *Cl. exusta*. In the young condition it has no cœnenchyma joining the corallites, and in this condition is believed to represent the genus *Rhizangia*. E. T. N.

Lycett, John. Monograph of the British Fossil *Trigoniæ*. No. II. pp. 53–92; plates x.–xix. Palæont. Soc.

Continues his description and figures of the British *Trigoniæ*. Twenty-six species are described, of which the following are new—

Trigonia Williamsoni, *T. paucicosta*, *T. Leckenbyi*, *T. Sharpiana*, *T. Joassi*, *T. Manselli*, *T. tenuitexta*, and *T. Beesleyana*. H. A. N.

McCoy, Prof. Frederick. Prodromus of the Palæontology of Victoria, or Figures and Descriptions of Victorian Organic Remains. Geological Survey of Victoria, Decade I., with ten plates. 8vo. Melbourne.

The first part treats of the Graptolites of the L. Silurian Slates, in which the auriferous veins of Victoria are contained. None of the species are new; but all are forms known in the Quebec Group of Canada and the Skiddaw Slates of England, except one or two species which the author identifies with types belonging to the Moffat series of Scotland. Ten species or varieties are described and figured.

The author describes and illustrates an extinct species of Wombat, which he names *Phascolomys Pliocœnus*. The remains of this animal are found in the gold-cement of Victoria, and show that the Auriferous Drifts are of the age of the Mammaliferous Crag of Britain.

The memoir is continued with plates and descriptions of 4 new species of *Voluta* (*V. Hannafordi*, *V. anticingulata*, *V. antiscalaris*, and *V. macroptera*) from the L. Miocene (Oligocene) deposits stretching from the shores of Hobson's Bay to the Murray.

The author next describes and figures 3 new species of *Podozamites* (*P. Barklyi*, *P. ellipticus*, and *P. longifolius*) from the Mesozoic coal-bearing deposits of Bellarine, near Geelong. Next, we have a plate and description of *Lepidodendron* (*Bergeria*) *australe*, of common occurrence in the red and yellow micaceous sandstones of the Avon river, Gippsland, which are Carboniferous. The author thinks it probably the same as that described by Carruthers as *L. nothum*.

The Decade is concluded with a plate and descriptions of two species of Starfish from U. Silurian beds. One of these is termed *Petraster Smythii*; and the other, nearly allied to *Uraster Ruthveni*, Forbes, is named *Urasterella Selwyni*. H. A. N.

Manzoni, Dr. Angelo. Rarità paleozoica. [A rare fossil (Tertiary).] Boll. R. Com. geol. Ital. pp. 152–159.

Notes the discovery of a fine specimen of *Pentacrinus Gastaldi* (Mich.) in the Mollasse of Montese, near Bologna, and reviews the few other occurrences of the genus in Tertiary beds. E. B. T.

Martens, E. von. Fossile Süsswasser-Conchylien aus Sibirien. Zeitsch. deutsch. geol. Gesell. Bd. xxvi. Heft. 4, pp. 741–751, with plate.

Describes 12 species of fossil freshwater shells, from the shore of the river Irtysch, near Omsk in Siberia. Includes the following new species—*Paludina* (*Vivipara*) *tenuisculpta*, *Lithoglyphus constrictus*, *Unio Pallasi*, *U. pronus*, and *U. bituberculosus*. F. W. R.

Maurer, F. Paläontologische Studien im Gebiete des rheinischen Devon. [Fossils from the Rhenish Devonian rocks.] Neues Jahrbuch, Heft. 5, pp. 453–459, with plate.

A list of fossils from a soft yellow fine-grained sandstone found near Giessen. It is a marine deposit in the upper part of the *Spirifer*-sandstone, rich in trilobites and polypes. Three species of *Pleurodictyum* are found here, viz. *P. problematicum*, *P. Petrii*, and a new species figured but not named. F. W. R.

Mayer, C. Description de Coquilles fossiles des terrains tertiaires supérieurs (suite). [Descriptions of fossil shells from the Upper Tertiaries.] Journ. Conch. 3 ser. t. xiv. pp. 308–316, pl. xi.

A continuation of a series of articles descriptive of Tertiary shells:—*Tornatella attenuata*, Lower Blue Marls of Bacedasco, near Piacenza; *T. Woodi* (near *T. Levidensis*), yellow sands of Castell' Arquato; *Cylichna tomata* (near *C.* [*Bulla*] *Regulbiensis*), Upper Blue Marls of the Piacenza district; *Bulla Weinkauffi*, Upper Blue Marls of Lugagnano, near Piacenza; *Trochus Castrensis*, Castell' Arquato, perhaps only a variety of *T. Adriaticus*; *T. argentarius*, intermediate between *T. magus* and *T. Buchi*, Lower Blue Asti Marls of Bacedasco; *T. laureatus* = *T. granulatus*, var. *polygonalis*, Upper Astian of Castell' Arquato; *T. Pauluccia* (near *T. millegranus*), Bacedasco; *Murex pagodula*, Lugagnano; *M. turbiniformis*, same locality. C. P. G.

Meek, Prof. F. B. Notes on some of the fossils figured in the recently issued fifth volume of the Illinois State Geological Report. Amer. Journ. ser. 3, pp. 189–193, 369–379, 484–490, 580–584, pl. vii.

Notes on various species of Crinoids, &c. The view is advanced that the tube or proboscis of the Palæozoic Crinoids was entirely anal in its functions, and not oral; the mouth is supposed to be central, at the radial point of the ambulacra, but "covered over by a vault of fixed solid calcareous pieces" [p. 374.] It is explained that some of the names on the plates escaped revision through the author's illness: e. g. *Schizodus Rossicus* (Vern.) is perhaps wrongly so named. The author considers that Prof. Geinitz's "Dyas" in Nebraska cannot be separated from the Carboniferous. E. B. T.

Meyn, L. Silurische Schwämme und deren eigenthümliche Verbreitung, ein Beitrag zur Kunde der Geschiebe. [Silurian Sponges.] Zeitsch. deutsch. geol. Gesell. Bd. xxvi. Heft. 1, pp. 41–58.

Regards certain chalcedonic pebbles from the Isle of Sylt as remains of Silurian sponges. Believes that free-living sponges were numerous in Palæozoic times, and that many so-called pebbles owe their form not to attrition, but to the original sponge which they represent. Suggests that the brown pebbles formerly imported to Kiel from England, and known as "Wallsteine," are such silicified sponges. F. W. R.

Miller, S. A. The Column of *Heterocrinus heterodactylus*. Cincin. Quart. Journ. Sci. vol. i. pp. 2, 3.

Description of the structure of the column of this Crinoid, as observed in specimens from the Cincinnati group.

——. "Pasceolus." Cincin. Quart. Journ. of Sci. vol. i. pp. 4–7, figs. 1–3.

Discusses the character of the genus *Pasceolus*, and describes two new species, *P. Darwini* and *P. Claudei*, from the Cincinnati group.

MILLER, S. A. Remarks on the genus *Conchicolites* of Nicholson. Cincin. Quart. Journ. Sci. vol. i. pp. 7–13, fig. 4.

Discusses the generic affinities of *Conchicolites* and *Ortonia*, and expresses the opinion that they must be amalgamated.

——. "Genus Ambonychia." Cincin. Quart. Journ. Sci. vol. i. pp. 14–16, figs. 5, 6.

Quotes the description of the genus *Ambonychia*, given by Hall, and enumerates from the Cincinnati group the following species—*A. bellistriata*, *A. radiata*, and *A. costata*. H. A. N.

——. "Genus *Anomalodonta*." Cincin. Quart. Journ. Sci. vol. i. pp. 16–18, figs. 7, 8.

Quotes a diagnosis of the genus *Anomalodonta*, proposed for the reception of *Ambonychia* (*Megaptera*) *alata*, *Megaptera Casei*, and a new species, *A. gigantea*. All these forms occur in the Cincinnati group. H. A. N.

——. Monograph of the Crustacea of the Cincinnati group. Cincin. Quart. Journ. Sc. vol. i. pp. 115–147, figs. 10, 11.

Gives full descriptions of previously recorded *Crustacea* from the Cincinnati group (5 species of Ostracoda, and 16 of Trilobites). Describes and figures as new an Ostracode, under the name of *Leperditia Byrnesi*; and likewise describes and figures some singular tracks, referred to *Asaphus*. H. A. N.

——. "*Cypricardites*." Cincin. Quart. Journ. Sci. vol. i. pp. 147, 148, figs. 12 & 13.

Describes a new species from the Cincinnati group, under the name of *C. Hainesi*.

——. "*Streptorhynchus* (?) *Hallii*." Cincin. Quart. Journ. Sci. vol. i. pp. 148, 149, figs. 14–16.

Describes a new Brachiopod from the Cincinnati group of Cincinnati.

——. "*Modiolopsis modiolaris*." Cincin. Quart. Journ. Sci. vol. i. pp. 149, 150, fig. 17.

Gives a description of *Modiolopsis modiolaris*, in which he is enabled to characterize the interior. The hinge-line is stated to be edentulous, with a ligamental groove commencing just in front of the beak, and extending to the posterior extremity. There is a deep circular muscular impression below and a little anterior to the beak; and the pallial line is distinct and marked by irregular pits. The specimen described is from the Cincinnati group. H. A. N.

——. "*Modiolopsis Versaillensis*." Cincin. Quart. Journ. Sci. vol. i. p. 150, figs. 18, 19.

Describes a species of *Modiolopsis*, which he believes to be new. It is stated to differ from *M. modiolaris* in having more prominent and angular beaks, and a different hinge-line and ligamentary attachments, and in having the muscular impression placed further in front of the beak. It is from the Cincinnati group of Versailles, Indiana. H. A. N.

Miller, S. A. Monograph of the Lamellibranchiata of the Cincinnati group. Cincin. Quart. Journ. Sci. vol. i. pp. 211–231, figs. 20–22.

Records and for the most part describes 31 previously known Bivalves from the Cincinnati group. The author also describes and figures a new species as *Tellinomya Hilli*. A new genus, *Cycloconcha*, is founded for the reception of a single shell (*C. mediocardinalis*). H. A. N.

——. "*Cyrtoceras Vallandighami.*" Cincin. Quart. Journ. Sci. vol. i. p. 232, fig. 23.

Describes a small species of *Cyrtoceras*, which he believes to be new, from the Cincinnati group, at Cincinnati.

——. "Species of *Beyrichia.*" Cincin. Quart. Journ. Sci. vol. i. pp. 232–234, figs. 24–27.

Describes 3 new species of *Beyrichia* (*B. Druryi*, *B. striato-marginatus*, and *B. Chambersi*) from the Cincinnati group of Ohio and Indiana. H. A. N.

——. "*Tentaculites Richmondensis.*" Cincin. Quart. Journ. Sci. vol. i. pp. 234, 235, fig. 28.

Describes a species from the Cincinnati group of Indiana.

——. "*Buthotrephis ramulosus.*" Cincin. Quart. Journ. Sci. vol. i. pp. 235–236, fig. 29.

Describes a branching fossil from the Cincinnati group of Cincinnati.

——. Monograph of the Gasteropoda of the Cincinnati group. Cincin. Quart. Journ. Sci. vol. i., pp. 302–321, figs. 30–34.

Describes 21 previously recorded species of *Gasteropoda* from the Cincinnati group. Describes as new species the following Gasteropods from the Cincinnati group—*Bellerophon Mohri*, *Cyrtolites elegans*, *C. carinata*, *Cyclora Hoffmanni*, and *Pleurotomaria Halli*. H. A. N.

——. "*Megalograptus.*" Cincin. Quart. Journ. Sci. vol. i. pp. 343–346, figs. 35–37.

A new genus is proposed for a fossil of an obscure nature, which he terms *M. Welchi*, and apparently regards as belonging to the *Graptolitidæ*. The specimen is from the Cincinnati group of Clarkville, Clinton County, Ohio. H. A. N.

——. "*Lichenocrinus tuberculatus.*" Cincin. Quart. Journ. Sci. vol. i. pp. 346, 347, fig. 38.

Describes and figures a species from the Cincinnati group of Richmond, Indiana.

Miller, S. A. "*Trematis Dyeri.*" Cincin. Quart. Journ. Sci. vol. i. p. 347, fig. 39.

Describes a species from the Cincinnati group of Cincinnati.

——. "*Beyrichia Richardsoni.*" Cincin. Quart. Journ. Sci. vol. i. pp. 347, 348, fig. 40.

Describes and figures a species of *Beyrichia* from the Cincinnati group of Ohio.

——. "*Glyptocrinus Fornshelli.*" Cincin. Quart. Journ. Sci. vol. i. pp. 348–351, fig. 41.

Describes and figures a species of *Glyptocrinus*, from the Cincinnati group of Ohio. The species is described as having a sharply pentagonal column, its arms not bifurcating for a considerable distance. H. A N.

Moesch, Dr. C. Monographie der Pholadomyen. Abh. Schweiz. paläont. Gesell. Bd. i. pp. 78, 26 plates.

Möller, Prof. Valerian von. Volborthia, eine neue Gattung fossiler Brachiopoden [*Volborthia*, a new genus of fossil Brachiopoda.] N. Jahrb. Heft. 5, pp. 449–452, with plate.

This genus is founded on specimens discovered by Dr. A. Volborth in the neighbourhood of Zzarskoje-Sselo. Some similar fossils were described by Prof. Kutorga under the name of *Acrotreta recurva*; but Von Möller gives his reasons for separating them from *Acrotreta*, and forming a new genus. F. W. R.

Mojsisovics, Dr. E. von. Ueber einige Trias-Versteinerungen aus den Süd-Alpen. [Trias fossils from the South-Alps.] Jahrb. k-k. geol. Reichs. Bd. xxiii. Heft. 4, pp. 425–438 [publ. 1874], with 2 plates of fossils.

The following new fossils are described:—*Trachyceras (Ammonites) Balatonicum*, from the Lower Alpine Muschelkalk; *T. Taramellii*, and *T Cuccense*, with the first at Monte Cucco (Friuli); *Natica Cuccensis*, from the Upper Muschelkalk of Monte Cucco; *N. terzadica* and *N. gemmata*, from Monte Terzadia (Friuli), below the Raibl horizon; *Posidonomya Idriana*, probably from the Carnic horizon; *P. pannonica*, and *P. alta*, from the Noric horizon, near Vaszoly; *Monotis megalota* (= *Halobia Lommeli*, Hauer, pars). E. B. T.

——. Ueber die triadischen Pelecypoden-Gattungen *Daonella* and *Halobia*. [Triassic genera of Pelecypoda, *Daonella* and *Halobia*.] Abh. k. k. geol. Reichs. Bd. vii. Heft. 2, pp. 37, with 5 plates

The genera *Posidonomya* and *Halobia*, include certain thin bivalve shells, with a considerable resemblance to the Crustacean group of the *Estheriæ*, but usually referred to the *Lamellibranchiata* (family *Aviculidæ*). This reference the author confirms; and he founds the new genus *Daonella* to include certain allied forms, which may be regarded as strictly intermediate between *Posidonomya* and *Halobia*. The generic characters of *Daonella* are the possession of a bivalve shell, without a byssal notch, equivalve, inequilateral, rounded in front and behind; umbones almost central, not projecting over the elongated and straight hinge-line; shell without ears, marked with radiating ribs. No ligamental pit or hinge-teeth, and no perceptible muscular impressions. The author shows that a great number of species of *Daonella* and *Halobia* have hitherto been indiscriminately placed together; and he defines the following new species of these genera, all from the Trias—*Daonella Gümbeli, D. Böckhi, D. obsoleta, D. Cassiana, D. Richthofeni, D. Styriaca, D. Beyrichi, D. solitaria, D. elongata, D. Tyrolensis, D. Badiotica, D. reticulata, D. tenuis, D. fluxa, D. Hungarica, D. Taramellii, D. obliqua, D. arctica, D. Lindströmi, Halobia raristriata, H. plicosa, H. Norica, H. amœna, H. Austriaca, H. Suessi, H. eximia, H. Charlyana, H. distincta, H. Celtica, H. fallax, H. superba, H. intermedia, H. Hochstetteri, H. Hoernesi,* and *H. Halorica.* H. A. N.

Mojsisovics, Dr. E. von. Die angeblichen Orthoceraten im alpinen Dogger. [The alleged Orthoceratites from the Dogger of the Alps.] Verh. k. k. Geol. Reichs. pp. 33, 34.

Shows that the fossils from the Jurassic strata of the Alps which have been referred to *Orthoceras* are really the phragmacones of species of Belemnites (*Aulacoceras*). H. A. N.

——. *Diplopora* oder *Gyroporella*? Verh. k. k. geol. Reichs. pp. 236, 237.

Defends the view that *Gyroporella* is truly a synopsis of the previously founded *Diplopora* [see Gümbel, p. 299.] H. A. N.

Mörch, Dr. O. Forsteningerne Tertiærlagene i Danmark [Tertiary Fossils of Denmark.] Meddelelse paa det 11te Skandinaviske Naturforskermöde i Kjöbenhavn.

Lists of fossils which have been determined by the author, as well from scattered vestiges of strata as from beds in place, are here ranged under heads of localities. The present classification of the Tertiaries being considered unsatisfactory, it is suggested to determine by conchological characters the temperature of the sea of a given period, and hence its antecedence to the glacial period. The following new species are described—*Bifrontia* (*Orbis*) *Pingelii, Scala* (*Opalia*) *Johnstrupi, Cerithium* (*Bittium*) *Vilandti, Turritella* (*Haustator*) *Beckii, Sigaretus (Stomatia) pumilio, Valvatina atlanta, Xylophaga Steenstrupi.* H. M.

Neumayr, Dr. M. Die Fauna der Schichten mit *Aspidoceras acanthicum* im östlichen Theile der Mediterranen Provinz. [Fauna of the *Aspidoceras acanthicum* Shales in the E. part of the Mediterranean Province.] Verh. k. k. geol. Reichs. pp. 29, 30.

Discusses the fauna of the above-mentioned beds, with special relation to the various forms of Ammonites, and the bearing of these upon the "descendence theory." H. A. N.

Nicholson, Prof. H. A. Descriptions of species of *Chætetes* from the Lower Silurian Rocks of North America. Quart. Journ. Geol. Soc. vol. xxx. pp. 499–515, pls. xxix. xxx.

Discusses the affinities and value of the genera *Stenopora*, *Chætetes*, and *Monticulipora*, and concludes that the American corals usually referred to *Stenopora* cannot be so placed, unless Lonsdale's definition of the genus be extended and modified. Also concludes that the distinctions between *Chætetes* and *Monticulipora* are such as can hardly be maintained, and therefore provisionally refers all the forms under immediate consideration to the genus *Chætetes*. Describes and figures the following new forms, besides others previously described—*C. approximatus*, *C. attritus*, *C. dedicatulus*, *C.* (?) *nodulosus*, *C. Jamesi*, *C. rhombicus*, *C. corticans*, and *C. Ortoni*. All the species occur in the Cincinnati Group of Ohio; and several of them are also found in the Hudson-River and Trenton Formations of Canada. H. A. N.

——. Descriptions of New Fossils from the Devonian Rocks of Canada West. Geol. Mag. dec. 2, vol. i. pp. 10–16, 54–60, 117–126, 159–163, 197–201, pls. ii. iv. vi. ix. and 3 figs.

Describes and figures a number of new species of corals, Polyzoa and Brachiopoda, from the Devonian rocks of Western Ontario, pending the publication of a complete report on the fossils of this formation. The following are the species—*Callopora incrassata* (C. & H.), *Alveolites frondosa* (H.), *A. Selwynii* (C.), *A.* (*Cœnites*?) *distans* (C.), *A. conferta* (C.), *A. ramulosa* (C.), *A. Billingsi* (C.), *Chætetes moniliformis* (H.), *C. Barrandi* (H.), *C. quadrangularis* (H.), *Heliophyllum subcæspitosum* (H.), *H. proliferum* (C.), *Productella Eriensis* (C.), *Leiorhynchus Huronensis* (H.), *Tæniopora exigua* (H.), *T. penniformis* (H.), *Ptilodictya Meeki* (C. & H.), *Clathropora intertexta* (C.), *Botryllopora socialis* (H.), *Ceriopora* (?) *Hamiltonensis* (H.), *Polypora pulchella* (C.), *P. tenella* (C.), *P. tuberculata* (H.) [this name must be abandoned, Prout having already described a species under the title], *Retepora Phillipsi* (C.), *Fenestella magnifica* (C.), *F. marginalis* (C.), *F. filiformis* (C.), *Spirorbis Arkonensis* (H.), *Ortonia intermedia* (H.). [The letters C. and H. respectively indicate occurrences in the Corniferous Limestone aud in the Hamilton Formation.] Also comprises descriptions of all the genera quoted above, including the two new genera *Botryllopora* and *Tæniopora*. H. A. N.

——. On *Columnopora*, a New Genus of Tabulate Corals. Geol. Mag. dec. 2, vol. i. pp. 253, 254 (with woodcut).

Establishes this genus for the reception of a coral from the Hudson-River group of Canada and the Cincinnati group of Ohio. The corallum is massive, aggregate, and composed of prismatic closely approximated corallites. It resembles *Favosites* in general form, but differs in having a well-defined septal system, and in having the walls perforated by very large and close-set mural pores. It also resembles *Columnaria* (*Favistella*), but differs in having the walls or the corallites perforated by numerous mural pores. The only species known is described under the name of *Columnopora cribriformis*. H. A. N.

NICHOLSON, Prof. H. A. Report on the Palæontology of the Province of Ontario (Parliamentary Report). Pp. 133, 8 plates, figs. 1–58. 8vo. Toronto.

Contains descriptions of 160 species of fossils from the Devonian Rocks (Corniferous Limestone and Hamilton Formation) of Western Canada, comprising *Protozoa,* 6 species, *Cœlenterata,* 72 species, *Brachiopoda*, 43 species, *Polyzoa*, 19 species, *Lamellibranchiata*, 1 species, *Pteropoda*, 1 species, *Gasteropoda*, 12 species, *Annelida*, 3 species, and *Crustacea*, 4 species. Most of the species are figured; and the following are described for the first time:—*Clisiophyllum pluriradiale*, *Heliophyllum proliferum*, *Favosites Chapmani*, *Platyceras uniseriale*, *Strophostylus* (?) *subglobosus*, *S.* (?) *ovatus*, *S.* (?) *obliquus*, *Holopea Eriensis*, *Helicotoma* (?) *serotina*, *Syringopora intermedia*. Also contains descriptions and figures of a number of other forms previously described by the author in the Geol. Mag., Ann. Nat. Hist., and Canad. Nat.

H. A. N.

——. On the Affinities of the genus *Stromatopora*, with descriptions of two new Species. Ann. Nat. Hist. ser. 4, vol. xiii. pp. 4–14, figs. 1–3. Supplementary to a paper in the Annals, Aug. 1873.

Gives reasons for concluding that *Stromatopora* should be referred to the *Calcispongiæ*, and some additional details with regard to *Stromatopora tuberculata* and *S. granulata*. Describes two fresh species, *S. perforata*, from the Corniferous Limestone of Western Ontario; *S. Hindei*, from the Niagara Limestone of Owen Sound, Ontario.

H. A. N.

——. Descriptions of two new Genera and Species of *Polyzoa* from the Devonian Rocks. Ann. Nat. Hist. ser. 4, vol. xiii. pp. 77–85, figs. 1, 2.

Proposes and describes two new genera of the family *Fenestellidæ* under the names *Cryptopora* and *Carinopora*. The species upon which these genera are founded are termed *Cryptopora mirabilis* and *Carinopora Hindei*, both from the Corniferous Limestone of Western Ontario.

H. A. N.

——. On *Duncanella*, a new Genus of Palæozoic Corals. Ann. Nat. Hist. ser. 4, vol. xiii. pp. 333–335, figs. *a–e*.

The name of *Duncanella* is proposed for certain small simple corals from the Niagara Formation of Indiana, U. S. The corallum is conical, free, and non-adherent, with septa in multiples of six, no columella, and a well-developed epitheca. The epitheca is deficient proximally, and leaves a small circular aperture from which the septa protrude in the form of a small cone. No tabulæ or dissepiments are present. The genus appears to be most nearly related to the *Turbinolidæ*; and the only known species is described as *Duncanella borealis*. H. A. N.

——. Summary of recent Researches on the Palæontology of Ontario, with brief Descriptions of some new Genera. Canad. Journ. N. Ser. vol. xiv. pp. 125–136.

Contains a summary of the palæontological results of researches in the Devonian Formation of Canada, with a list of the fossils identified (160 species). The Polyzoan genera *Botryllopora*, *Carinopora*, *Tæniopora*, and *Cryptopora* are briefly described. H. A. N.

Nicholson, Prof. H. A, and G. J. Hinde. Notes on the Fossils of the Clinton, Niagara, and Guelph Formations of Ontario, with descriptions of new Species. Canad. Journ. N. Ser. vol. xiv. pp. 137–160, figs. 1–6.

Note the species of fossils they had met with in an examination of the Clinton, Niagara, and Guelph Formations of Ontario. 35 species are recorded from the Clinton formation, including two new species (*Ptilodictya? punctata* and *Tentaculites neglectus*); 49 species from the Niagara formation, including the new forms *Cœnites lunata*, *Alveolites Niagarensis*, *Astræophyllum gracile* (n. gen.), *Cannapora annulata*, and *Clathropora intermedia*; 20 species from the Guelph formation, including the new form *Megalomus compressus*. All the species presenting points of special interest, or previously imperfectly characterized, are treated in detail, the rest being simply enumerated. H. A. N.

Nyst, H. Description de deux coquilles fossiles du terrain éocène de Belgique. [Two new shells from the Eocene of Belgium.] Ann. Soc. Mal. Belg. t. viii. Mém. pp. 16–18, plate i.

Both shells belong to the Paniselian of Dumont. They are:—*Leda Corneti*, from Morlauwetz, Trazegnies, and Bascoup; and *Arca Briarti*, from Bascoup. G. A. L.

——. Description d'une coquille fossile du terrain éocène de Belgique. [Description of a fossil shell from the Eocene of Belgium.] Ann. Soc. Mal. Belg. t. viii. Mém. pp. 19, 20, pl. i.

Cyprina Roffiæni, Lefèvre, from the Laekenian of Wemmel, near Laeken.

Oustalet, E. Recherches sur les insectes fossiles des terrains tertiaires de la France. 2^{me} partie. Insectes fossiles d'Aix en Provence. [Fossil insects of Aix in Provence.] Ann. Sci. Géol. t. v. nos. 1 & 2, pp. 347 (6 plates).

A *résumé* is given of what has been written on the stratigraphy, M. Matheron's views being noticed at some length. All the plants and insects of this locality come from the floor of the upper bed of gypsum. They are paralleled with the *Ostrea cyathula* beds of the Paris Basin, or are on the confines of the Eocene and Miocene (Oligocene). In the systematic description of the insects the following species are new—*Nebria Tisiphone*, *Panagæus dryadum*, *Feronia minax*, *F. provincialis*, *Harpalus Nero*, *H. deletus*, *Stomis elegans*, *Polystichus Hopei*, *Hydrophilus antiquus*, *H. incerta*, *Læcobius vetustus*, *Stenus gypsi*, *Achenium ingens*, *Erinnys elongata*, *E. deleta*, *Staphylinus calvus*, *S. Germarii*, *S. provincialis*, *S. aquisextanus*, *S. atavus*, *S. prodromus*, *S. priscus*, *Quedius Reynesii*, *Q. Lorteti*, *Hygronoma deleta*, *Scydmænus Heerii*, *Triphyllus Heerii*, *Onthophagus luteus*, *Geotrupes atavus*, *Anthicus melancholicus*, *Hipporhinus Reynesii*, *Brachyderes longipes*, *B. aquisextanus*, *Cleonus Marcellii*, *C. inflexus*, *C. pygmæus*, *Tanysphyrus deletus*, *Hylobius Carbo*, *Plinthus Heerii*, *Phytonomus annosus*, *Coniatus minusculus*, *Erirhinus Chantrei*, *Hydronomus nasutus*, *Sybines melancholicus*, *Cryptorhynchus gypsi*, *Cœliodes primigenius*, *Cossonus Marionii*, *Curculionites exiguus*, *Clytus leporinus*, *Crisceris margarum*, *Chrysomela matrona*, *C. Matheroni*, *C. debilis*, *Gonioctena Curtisii*. E. B. T.

PÁVAY, Dr. E. A Budai Márga Ásatag Türckönczei. [Fossil Echinidæ of the clays and marls near Budapest.] Magyar Kir földtani Intezet Évkönve. [Royal Hungarian Geological Institution.] Pp. 165–333, i–viii; plates viii.–xi. *a*, xi. *b*–xii. *b*. Budapest. In German and Magyar.

Introduction p. 179. Vocabularium terminologicum, pp. 189–196. Description of species, pp. 197–335. The following new species are described and figured:—*Cidaris hungarica* (Eocene), *Rabdocidaris posthumus* (U. Eocene), *Echinocyamus Dacicus* (Eocene), *Clypeaster Corvini* (Oligocene), *Echinolampas subellipticus* (Oligocene), *Conoclypeus oligocænus*, *Periaster Széchenyii* (Oligocene), *Schizaster Lorioli* (U. Eocene), *Pericosmus Arpádis* (U. Eocene), *P. Budensis* (U. Eocene), *Toxobrissus Haynaldi* (U. Eocene). New genus *Deákia*, belonging to the *Brissoideæ*: species *D. rotundata* (U. Eocene), *D. ovata*, *D. cordata*, *Macropneustes Hantkeni* (U. Eocene). Some other species are critically noticed. W. W.

PRICE, P. G. H. New shells from Gault, Folkestone. See pp. 31, 32.

QUENSTEDT, F. A. Petrefactenkunde Deutschlands. Abth. 1, vol. iii. Echinoderms, Part 6. 8vo. Leipzig. Atlas fol.

RAINCOURT, — DE. Description d'espèces nouvelles du Bassin de Paris. [New species from the Paris Basin.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 202–205, pl. vi.

The new species described are named as follows:—*Avicula Chaussyi* and *Crania eocenica*, from Chaussy; *Solarium jucundum*, from Chaumont; *Cerithium Caroli*, from Cuise-la-Motte; *Murex plini*, from Orme; *Triton Bazini*, from Cuise-la-Motte; *Voluta Berthæ*, from Mary; *Cypræa Sellei*, from Chaumont. The plate is heliographic and exactly represents even the smallest details. G. A. L.

RATHBUN, RICHARD. On the Devonian Brachiopoda of Ereré, Province of Pará, Brazil. Bull. Buff. Soc. Nat. Sci. pp. 236–261.

The following new species are described, with references to plates that are to be published:—*Terebratula Derbyana*, Hartt; *Spirifera Pedroana*, Hartt; *S. Elizæ*, Hartt; *S. Valenteana*, Hartt; *Cyrtina* (?) *Curupira*, *Retzia Jamesiana*, Hartt, *R. Wardiana*, Hartt; *Orthis Nettoana; Streptorhynchus Agassizii*, Hartt; *Chonetes Cornstockii*, Hartt; *C. Herbert-Smithii*, Hartt; *C. Onettiana*, *Lingula graçana*, *L. Stauntoniana*, and *L. Rodriguezii*. Other species are noticed; and the fauna is paralleled with that of the Hamilton group of New York. W. W.

Reuss, Prof. Ritter von. Die fossilen Bryozoën des oesterreichisch-ungarischen Miocäns. [The fossil Bryozoa of the Austrian-Hungarian Miocene.] Sitzb. k. Ak. Wiss. math.-naturw. Classe. Abth. 1, Bd. lxviii. Hefte 3–5, pp. 219–222.

A brief notice of a Memoir which is to appear in the 'Denkschriften.' Some of the species described in the author's former memoir in Haidinger's 'Abhandlungen,' 1849, are now suppressed. The present notice mentions 17 species of *Membranipora*, 75 of *Lepralia*, 2 of *Scrupocellaria*, 1 of *Cellaria*, and 1 of *Salicornaria*. E. B. T.

Ryle, T. On Cretaceous Fossils from the Isle of Wight. Papers, Eastbourne Nat. Hist. Soc. 1873–74, pp. 11–13.

Schlüter, C. Die Belemniten der Insel Bornholm: ein Beitrag zur Altersbestimmung des Arnagerkalkes. [Belemnites of Bornholm.] Zeitsch. deutsch. geol. Gesell. Bd. xxvi. Heft 4, pp. 827–855.

Describes a new species of Belemnites as *B. westfalicus*, as it is known also in Westphalia. The greensand of Bornholm may be the equivalent of the Ems marl. F. W. R.

Schmidt, Fr. Miscellanea Silurica. I. Ueber die Russischen silurischen Leperditien, mit Hinzuziehung einiger Arten aus den Nachbarländen, no. 2. [Russian Silurian Leperditiæ.] Mem. Imp. Ac. Sc. St. Petersburg, vol. xxi. (1873–74).

Schulze, Prof. Max. Latest Observations on *Eozoön Canadense*. Ann. Nat. Hist. ser. 4, vol. xiii. pp. 379, 380.

A letter expressing his belief that the so-called "proper wall" of *Eozoön* is an inorganic structure. H. A. N.

Seguenza, G. [Pliocene of S. Italy.] See p. 95.

The new species are *Alvania* (subgen. of *Rissoa*) *tenuicostata*, *A. circumcincta*, *A. bicingulata*, *A. elegantissima*, *A. angulata*, *Zizyphinus* (subgen. of *Trochus*) *panormum*, *Cyclostrema levissimum*, *Isocardia*, n. sp., *Chama*, n. sp., *Limopsis tenuis*. There is a chapter headed "Brief remarks on the fauna of the upper zone of the newer Pliocene," then one on the second zone of the Pliocene of Monte Mario, near Astigiano, and in Tuscany, and another on the fauna of the *lower* zone of the Recent Pliocene. G. A. L.

Sjögren, A. Cambrian Fossils, Öland: see p. 96.

Souverbie, Dr. Description d'un Helix fossile du miocène supérieur de Cestas. [Fossil Helix from the U. Miocene of Cestas.] Journ. Conch. 3 sér. t. xiv. pp. 317, 318, pl. x.

The new species described, *Helix subconstricta*, is interesting from its resemblance to *H. constricta*, a species distinguished by its exceedingly narrow aperture, till lately almost unique, and still one of the rarest French land-shells. C. P. G.

Stache, Dr. Guido. Ueber die untereocäne Local-Fauna von Cosina in Istrien. [The Eocene fauna of Cosina, Istria.] Verh. k.-k. geol. Reichs. pp. 17–21.

Gives an account of the peculiar local fauna of the Cosina deposits, and concludes that we may regard it as Eocene, and as one of the earliest freshwater faunas of the period, not as referable to the top of the Cretaceous. H. A. N.

Steinhardt, E. Die bis jetzt in preussischen Geschieben gefundenen Trilobiten. [The Trilobites in the Erratics of Prussia.] Beit. Naturk. Preus. phys.-ökon. Gesell. Königsberg. Pp. 64, with 6 plates.

A monograph descriptive of all the Trilobites which have been found in the erratic boulders of Prussia. These boulders are chiefly of limestone from the Silurian deposits of Scandinavia and Russia. The author describes and figures 48 species of Trilobites from them. Most of the forms occur in the Silurian rocks of Sweden and Russia. 15 species are found both in Sweden and Russia, 17 in Russia alone, 5 in Sweden alone. 29 are L. Silurian, 7 are U. Silurian, and 1 belongs to both groups. 20 of the species occur in the erratics of the great plain of Northern Germany out of Prussia; and 1 (*Lichas tricuspidatus*, Beyr.) is hitherto only known as occurring in these boulders. Besides species already known, and others which could not be determined, the following new species are described—*Asaphus platyrhachis*, *A. tecticaudatus*, *A. undulatus*, *Lichas velata*, *L. æquiloba*, and *L. quadricornis*. H. A. N.

Strong, E. A. Notes on the Fossil Remains of the Lower Carboniferous Limestone exposed at Grand Rapids, Michigan. Miscel. Papers Kent Sci. Inst. no. 3, pp. 6.

Struckmann, C. Kleine palaeontologische Mittheilungen. Zeitsch. deutsch. geol. Gesell. Bd. xxvi. Heft 2, pp. 217–224.

Notes the occurrence of *Terebratula trigonella* in the Upper Jura, near Goslar, and occurrence of the Eimbeckhäusen Plattenkalk with *Corbula inflexa*, near Ahlem, Hanover. F. W. R.

Swinton, A. H. Notes on certain Fossil Orthoptera claiming affinity with *Gryllacris*. Geol. Mag. dec. 2. vol. i. pp. 337–341, pl. xiv. and fig. 5.

Discusses the characters of the wings, upon which have been founded the *Gryllacris Ungeri* from the Eocene, and the *G.* (*Corydalis*) *Brongniarti*, from the Coal Measures. These are critically compared with the wing of recent species of *Gryllacris*. Also notices the occurrence of a well-marked "file" in the wing of *Gryllacris Brongniarti*. H. A. N.

Taramelli, Prof. T. Di alcuni Echinidi eocenici dell' Istria. [Eocene Echinidæ from Istria.] At. R. Ist. Ven. Sci.

Records observations on the Echinoids from the older Tertiary beds of Istria, and describes as new the species *Cidaris Scampicii*, *C. tuber-*

culosa, *Echinolampas Stoppanianus*, *E. Luciani*, *Hemiaster Covazii*, and *Micraster Stacheanus*. H. A. N.

Tawney, E. B. Museum Notes—Dundry Gasteropoda. Proc. Bristol Nat. Soc. ser. 3, vol. i. part i. pp. 9–59, plates i.–iii.

Describes all the species of Gasteropoda from the Inf. Oolite of Dundry Hill in the Museum at Bristol. Notes 66 species in a determinable condition, of which 19 appear not to have been previously figured, while 15 others are added to the list of British fossils. The following new species are described—*Purpurina inflata*, *Euspira Dundriensis*, *Alaria Dundriensis*, *A. trinitatis*, *A. Etheridgii*, *Littorina recte-planata*, *Turbo Stoddarti*, *T. Dundriensis*, *T. Shaleri*, *Trochus Sandersii*, *T. Winwoodii*, *Straparollus Dundriensis*, *Cirrus pyramidalis*, *Pleurotomaria Sandersii*, *P. obconica*, *P. distinguenda*, *P. Dundriensis*, *P. Stoddarti*, *P. Yeovilensis*. H. B. W.

Terquem, M. O. Quatrième Mémoire sur les Foraminifères du Système Oolithique, comprenant les genres *Polymorphina*, *Guttulina*, *Spiroloculina*, *Triloculina*, et *Quinqueloculina* de la zone à *Ammonites Parkinsoni* de Fontoy (Moselle). [Fourth Memoir on the Foraminifera of the Oolitic Series, comprising the genera *Polymorphina*, *Guttulina*, *Spiroloculina*, *Triloculina*, and *Quinqueloculina* of the zone of *Ammonites Parkinsoni* of Fontoy.] Paris, pp. 279–338, pls. xxx.–xxxvii.

In this instalment of his work the author describes and figures the following species as new:—*Polymorphina Fontinensis*, *P. Oolithica*, *P. intorta*, *P. amygdala*, *P. disjuncta*, *P. annulata*, *Guttulina disparilis*, *G. gibbosa*, *G. intricata*, *Spiroloculina infraoolithica*, *S. vermiformis*, *S. intorta*, *Triloculina costata*, *T. Fontinensis*, *T. variabilis*, *Quinqueloculina impressa*, *Q. ovula*, *Q. gibberula*, *Q. inconstans*, and *Q. angulata*. He also discusses the characters of the above-mentioned generic types. H. A. N.

Thomson, James. Descriptions of New Corals from the Carboniferous Limestone of Scotland. Geol. Mag. dec. 2, vol. i. pp. 556–559, pl. xx.

Describes a new genus of *Cyathophyllidæ* under the name of *Rhodophyllum*. The genus is in many respects allied to *Cyathophyllum*, but differs in the possession of a columellar boss, which is dome-shaped, "slightly raised above the inner margin of the primary septa, and clasped by subconvolute ridges." Four species of the genus, all new, are described under the names of *Rhodophyllum Craigianum*, *R. Slimonianum*, *R. simplex*, and *R. Phillipsianum*, all from the Lower Carboniferous rocks of Ayrshire and Lanarkshire. H. A. N.

Toula, Dr. Franz. Kohlenkalk- und Zechstein-Fossilien aus dem Hornsund an der Süd-Westküste von Spizbergen. [Carboniferous and Permian fossils from the Horn Sound on the S.W. coast of Spitzbergen.] Sitzungsb. k.-k. Ak. Wiss. math.-nat. Cl. Bd. lxx. 1874, pp. 133–156, plate.

An examination of the fossils from the Horn Sound shows forms identical with, and allied to, both Permian and Carboniferous types. As these occur sometimes in the same hand-specimen, the occurrence is interesting in connexion with the question of the passage between Carboniferous and Permian formations. The fossils are nearly all Brachiopods; the following species are described as new—*Spiriferina Hoferiana*, *Productus Wilczeki* and *P. Spitzbergianus*, *Aviculopecten Wilczeki*. The total number of species and varieties determined is 18.
E. B. T.

Toula, Dr. Franz. Kohlenkalk-Fossilien von der Südspitze von Spitzbergen. [Carboniferous fossils from the S. point of Spitzbergen.] Sitzb. k.-k. Ak. Wiss. math.-nat. Cl. Abth. I. Bd. lxviii. Heft 3–5, pp. 267–291. 5 plates.

The prevailing fossils brought from the southern part of the island are *Productæ*, *Spiriferæ*, and *Streptorhynchi*. There is a total of 12 species, which occur elsewhere in Europe, 5 new sp. and 7 forms which are too imperfect to have specific names put to them.

The new species are, *Spirifera striato-paradoxa*, *S. Wilczeki; Productus Payeri*, described from casts of the interior, *P. Weyprechti*, and *Rhabdichnites granulosus*, probably the remains of a plant-stem.
E. B. T.

——. [Spitzbergen fossils.] N. Jahrb. Heft ix. pp. 964, 965.

A letter giving a list of fossils from Spitzbergen, determined by the writer.

Tournouër, R. Sur le *Cerithium bidentatum*, Grateloup, et sur le *Cerithium lignitarium*, Eichwald. [*C. bidentatum* and *C. lignitarium*.] Journ. Conch. 3 sér. t. xiv. pp. 120–126.

Considers that the Miocene species described by Hörnes as *C. lignitarium* is *C. bidentatum*, and that the *C. Duboisi*, Hörnes, is the true *lignitarium*. The *C. bidentatum* is a true *Pyrazus*, and derived immediately from *C. gibberosum*, Grateloup, of the Oligocene of Gaas, which in its turn is very similar to *C. Blainvillei* of the U. Calcaire Grossier. From *C. bidentatum* the recent Asiatic *Pyrazi* are certainly descended. *C. lignitarium* is also a *Pyrazus*, but rather abnormal, more resembling the *Potamides* of the Paris Basin, and descending by a curious series of intermediate forms from *C. gibberosum*, var. β, Grateloup, of the Oligocene, and *C. interruptum*, Desh., of the U. Calcaire Grossier.
C. P. G.

——. Description d'un nouveau genre fossile de la famille des Turbinidées, du terrain Oligocène. [Description of a new genus of *Turbinidæ*, from the Oligocene.] Journ. Conch. 3 sér. t. xiv. pp. 284–287, pl. ix. fig. 1.

This genus, *Lesperonia*, differs from all other genera of the family, to which its brilliantly nacreous shell proves it to belong, by its continuous, thick, somewhat reflected peristome. The general form of the shell is that of an *Elenchus* with carinated whorls. The species described is *L. princeps*, from the M. Oligocene of Lesperon, near Dax. C. P. G.

TOURNOUËR, R. Description des Coquilles fossiles des Faluns. [Fossil shells from the Fahluns.] Journ. Conch. 3 sér. t. xiv. pp. 288–308, pls. ix. x.

The following new species are described and figured:—*Lacuna Bourgeoisi*, near *L. eburniformis*, M. Miocene, Pont Levoy; *Mathilda Semperi*, near *M. quadricarinata*, Brocchi, same locality; *Scalaria Banoni*, Cestas, near Bordeaux; *Desmoulea nana*, Pont Levoy; *Coralliophila Burdigalensis*, L. Miocene, Le Haillan near Bordeaux; *Coralliophila* (?) *noduliformis*, Pont Levoy; *Columbella Linderi*, M. Miocene, Mérignac, near Bordeaux; *Meleagrina Bourgeoisi*, Pont Levoy; *Lucina callipteryx*, M. Miocene, Cestas. C. P. G.

——. New Pliocene shells, see "Addenda."

TRAUTSCHOLD, H. Die langlebigen and die unsterblichen Formen der Thierwelt. [The persistent and undying types of Animal Life.] Bull. Soc. Imp. Nat. Moscou, No. i. pp. 165–183.

Contrasts the variability of certain forms of animal life with the persistence and immobility of others. Even in the variable forms the variability is not indefinite, and he believes that changes of external conditions have little to do with the origin of modifications of form. Such proofs of variation as are afforded by palæontology do not, he thinks, support the views of Darwin, but point to the probability that variation has been effected *per saltum*, each organism having an inherent power of modifying its form. He discusses the persistency of certain types, pointing out that the sea must have varied in composition at different periods; he adduces examples of the genera *Chætetes*, *Lingula*, *Terebratula*, *Rhynchonella*, *Spirifera*, *Lucina*, *Pinna*, *Natica*, *Trochus*, and *Nautilus*, which have endured through long periods without undergoing much or any modification. He quotes species of each genus which have been described from different formations under distinct names, but which he believes to be identical. Some forms he thinks may fairly be called "undying." Thus, he believes the *Trochus ellipticus* of the Silurian to be identical with the existing *T. Niloticus*; and he identifies *Nautilus lineatus* of the L. Oolites with the recent *N. pompilius*. Finally, he thinks that, within certain limits, animals have the power of altering their form to meet alterations in their surroundings. H. A. N.

TRIBOLET, MAURICE DE. Description des Crustacés du terrain néocomien du Jura neuchâtelois et vaudois. [Neocomian Crustacea from the Neuchâtelese and the Vaudois Jura.] Bull. Soc. géol. France, 3 sér. t. ii. pp. 350–365, pl. xii.

The new species described are:—*Æglea Robineaui*, L. Neocomian (marls of Hauterive); *Callianassa infracretacea* and *Glyphea Couloni*, same formation, Sainte-Croix; *Hoploparia Neocomensis*, same formation, St. Aubin, Hauterive, and Ste. Croix; *H. Latreillei* and *Prosopon Camdichei*, same formation, Ste. Croix.

A catalogue of all the Cretaceous Macrurous, and Anomurous Decapoda concludes the paper. G. A. L.

Tribolet, Maurice de. Notes . . . Paléontologiques sur le Jura neuchâtelois, see p. 104.

Tute, S. J. Organisms in Carboniferous Flint or Chert. Science Gossip, No. 116, p. 188, woodcut; see also p. 217.

The specimens are from the Yoredale series, and are thought to be Foraminiferous.

Vanden Broeck, Ernest. Quelques considérations sur la découverte dans le calcaire carbonifère de Namur d'un fossile microscopique nouveau appartenant au genre Nummulite. [Discovery of a Nummulite in the Carboniferous Limestone of Namur.] Ann. Soc. géol. Belg. t. i. Mém. pp. 16–27.

Chiefly an account of Mr. H. B. Brady's researches respecting Carboniferous Foraminifera, with an abstract of his paper on *Nummulina pristina* (see p. 288). G. A. L.

Vilanova y Peira, Juan. Estructura de las rocas Serpentinosas y el *Eozoön Canadense*. Soc. Españ. Hist. Nat. vol. iii. parts 2, 3.

States reasons for considering the *Eozoön Canadense* no organism whatever, and asserts that what has been accepted as the remains of a Foraminiferous animal is merely the peculiar mineralogical structure of Serpentine and other allied rocks. J. M'P.

Vincent, —. Deux Gastéropodes nouveaux pour la faune bruxellienne. [Two Gasteropoda new to the Bruxellian.] Ann. Soc. Mal. Belg. t. viii. Bull. p. x.

The shells are *Pleurotoma clavicularis*, var. B., and *Voluta athleta*. Both come from the *Rostellaria-ampla* and *Venus-suberycinoïdes* zone in the Bruxellian at Uccle near Brussels. G. A. L.

Ward, Dr. Ogier. On some Forms of Cuttle-fishes or Cephalopoda, Recent and Fossil. Papers Eastbourne Nat. Hist. Soc. 1873–4, pp. 21, 22.

Thinks that the shells of some of the Ammonitidæ may have been internal.

Waters, A. W. Remarks on Fossils from Oberburg, Styria. Quart. Journ. Geol. Soc. vol. xxx. pp. 339–341.

By means of fossils from the Eocene beds of Oberburg and Neustift. several species are added to the list published by Stur (Geologie der Steiermark). H. A. N.

Wetherell, John W. On some Fossils from the Margate Chalk. Proc. Geol. Assoc. vol. iii. no. 5, pp. 192–197.

The fossils were got from the bottom part of the cliff, of which a general section is given (woodcut). The list is followed by some ob-

servations on some of the fossils; and it is remarked that those in the Brighton Chalk are of the same description as those at Margate.

W. W.

White, Prof. C. A. The proposed genus *Anomalodonta* of Miller identical with the earlier *Megaptera* of Meek. Amer. Journ. ser. 3, vol. viii. pp. 218, 219.

A note to the above effect. Mr. Miller's species *gigantea* is further said not to furnish characters justifying its separation from Meek's species *M. alata*. A question of priority. G. A. L.

——. Preliminary Report upon Invertebrate Fossils collected by the Expeditions of 1871, 1872, and 1873, with Descriptions of New Species. Geogr. and Geol. Exp. and Surv. W. of the 100th Meridian, Washington, pp. 27.

Whiteaves, J. F. Notes on the Cretaceous Fossils collected by Mr. James Richardson at Vancouver and the adjacent Islands. Rep. Geol. Surv. Canada, pp. 260–268 (with plate) [see under Selwyn, p. 127].

The Vancouver coal-bearing series is referred to the Chico group of American geologists, probably synchronous with the U. Cretaceous of Europe. The following new species are described and figured—*Lucina Richardsonii*, *Conchocele Cretacea*, *Astarte cardinioides*, *A. Vancouverensis*, *Tellina Meekiana*, *Fasciolaria nodulosa*. R. E. Jun.

Wood, Searles V. Supplement to the Monograph of the Crag Mollusca, with Descriptions of Shells from the U. Tertiaries of the E. of England. Vol. iii. Univalves and Bivalves, pp. 99–231, pls. viii.–xii. Palæont. Soc. vol. xxvii. for 1873.

No fresh species of *Pteropoda* is recorded; but 34 of *Lamellibranchiata* are added to the British list. A great deal of new information is also given with regard to a number of Bivalves described in the original Monograph. No absolutely new species are described. 5 species of Brachiopods are noticed, one, *Discina fallens*, being new. In an appendix the author gives additional information as to the Crag Gasteropods, and describes as new *Pleurotoma tereoides*, *Odostoma dentiplicata* and *Clausilia Pliocena*. Two new Bivalves, *Avicula phalænoides* and *Scacchia lata*, are at the same time described. Concludes with a chapter on the general characters of the Molluscan fauna of the Crags, and a Synoptical list of the marine mollusca from the U. Tertiaries of the East of England. H. A. N.

Woodward, Henry. Description of a New Species of Starfish from the Devonian of Great Inglebourne, Harberton, South Devon. Geol. Mag. dec. 2, vol. i. pp. 6–10.

Describes and figures a species of starfish found by Mr. Champernowne (see p. 6), belonging to the *Solasteriæ*, and apparently to the genus *Helianthaster*. It is, however, specifically distinct, and is described under the name of *H. filiciformis*. Likewise gives some notes on two species of *Palæaster* and two of *Protaster*, which have been obtained from the U. Devonian of Pilton, N. Devon, and which are preserved in the Museum of Practical Geology. Finally cites 14 species of Asteroids and Ophiuroids from the Palæozoic rocks in completion of a former list of the known Palæozoic forms of these orders (Geol. Mag. vol. vi. p. 241). H. A. N.

WOODWARD, HENRY, and R. ETHERIDGE, Jun. On some Specimens of *Dithyrocaris* from the Carboniferous Limestone Series, East Kilbride, and from the Old Red Sandstone of Lanarkshire. Geol. Mag. dec. 2, vol. i. pp. 107–111, pl. v. (Continued from November, 1873, p. 486.)

Describe three new species from the Carboniferous shale overlying the Calderwood Cement-stone of the East-Kilbride district, Lanarkshire, —*D. ovalis*, *D. granulata*, and *D. glabra*; also a new species *D.? striata*, from greenish-grey shales of the Old Red Sandstone, at Carmichael Burn, S.E. of Lanark. Express the opinion that *Dithyrocaris* may be broken up into two sections which may prove to be of generic value. In one section are forms like *D. Scouleri*, *D. Colei*, and *D. ovalis*, in which the carapace is entire in front, or only slightly indented or curved in outline. In the other group are forms like *D. granulata* and *D. glabra*, in which the carapace is more or less deeply indented anteriorly and posteriorly, so as to cause it to separate more readily along the mesial line. H. A. N.

WRIGHT, Dr. THOMAS. Monograph on the British Fossil Echinodermata from the Cretaceous Formations (vol. i. part 6). On the Echinoconidæ (pp. 185–224, pls. xlv.–lii.) Palæont. Soc. vol. xxvii. for 1873.

Gives descriptions, with figures, of five species of *Discoidea* and *Echinoconus*. All the species described have been previously recorded. Defines the order *Echinoconidæ*, and discusses at length the synonymy of several of the genera of the *Echinoidea*. Gives a translation of that part of Dr. Breynius's rare 'Dissertatio physica de Polythalamiis, de Belemnitis, de Echinis,' which relates to the Sea-urchins, and shows that many generic names which have long been current must be abandoned in favour of the older names of Breynius. H. A. N.

WRIGHT, Dr. THOMAS. Petrefacten aus der Rhaetischen Stufe bei Hildersheim. [Rhætic fossils from Hildersheim.] Zeitsch. deutsch. geol. Gesell. Bd. xxvi. Heft iv. p. 821; part of plate.

Describes a new starfish, as *Ophiolepis Damesii*, from Rhætic beds, discovered by H. Rœmer.

YOUNG, Prof. JOHN, and JOHN YOUNG. New Carboniferous Polyzoa. Quart. Journ. Geol. Soc. vol. xxx. pp. 681–683, pls. xl., xli.

Propose a new genus, *Actinostoma*, and a new species, *A. fenestratum*, for a new Carboniferous Polyzoon belonging to the group of the *Fenestellidæ*. The polyzoary in this form closely resembles that of *Fenestella*, being fenestrated and poriferous on one face only. There are, however, no carinæ; the cell-mouths are furnished with radiating teeth; and a second aperture, the diameter of which is about one third of that of the cell-mouth, is situated close to one end of each cell. The non-poriferous side of the frond is smooth or finely tuberculated. The species is found in the Limestone-shales of Capelrig and Hairmyres, East Kilbride, West of Scotland. Also describes a form closely resembling the preceding in its denticulated cell-aperture and the existence of a second smaller opening near the cell-mouth, but which is not fenestrated, and appears to have the generic characters of *Glauconome*. It is named *G. stellipora*, and is found in the Limestone-shales of the West of Scotland. H. A. N.

YOUNG, Prof. JOHN, and JOHN YOUNG. On *Palæocoryne* and other Polyzoal Appendages. Quart. Journ. Geol. Soc. vol. xxx. pp. 684–687, pls. xl.–xliii.

Express the opinion that the genus *Palæocoryne*, founded by Prof. Duncan and Mr. Jenkins, and believed by them to belong to the *Corynida*, is really based upon peculiar sterile processes, which are occasionally developed upon the fronds of *Fenestella*, *Polypora*, and other members of the *Fenestellidæ*. They also believe that different forms of *Polyzoa* produce different kinds of *Palæocoryne*, and that the structures so called are developed chiefly from the poriferous face of the frond. H. A. N.

—— ——. On a New Genus of Carboniferous Polyzoa. Ann. Nat. Hist. ser. 4, vol. xiii. pp. 335–339, pl. xvi. B.

Examine the generic value and affinities of the genus *Ceriopora*, with special reference to the Carboniferous form *Millepora gracilis* (= *Ceriopora gracilis*, Morris). This species they conclude to be entitled to separation from *Ceriopora*, however this genus be ultimately defined, on account of their discovery that the stem consists of a hollow, calcareous axial tube, round which the cells are ranged. They propose, therefore, the name of *Rhabdomeson gracile* for this form, the full definition of the genus *Rhabdomeson* being reserved until they have carried out more complete investigations into allied species. *R. gracile* occurs in the Carboniferous Limestones and shales of the West of Scotland. H. A. N.

—— ——. Note on the Occurrence of *Polypora tuberculata*, Prout, in Scotland. Geol. Mag. dec. 2, vol. i. pp. 258, 259.

Have identified *Polypora tuberculata*, as occurring commonly in the Carboniferous rocks of the West of Scotland. Prout's description is quoted at length; and some additional characters are mentioned. A note is added on the occurrence of a peculiar incrusting layer of mineral matter, sometimes covering the stems and fronds of various species of *Polyzoa* in the Carboniferous rocks of Lanarkshire, and concluded to consist of sulphate of lime, perhaps having some relation to the *Hemitrypa* of Phillips. H. A. N.

YOUNG, JOHN. Notes accompanying Two Slides of Carboniferous Polyzoa from the Fossiliferous Shales of Hairmyres, near East Kilbride. Trans. Edin. Geol. Soc. vol. ii. pt. iii. pp. 400–402.

Relates in part to the new Polyzoan genus *Rhabdomeson* (see above). Points out that *Millepora gracilis* and *M. rhombifera* belong to *Rhabdomeson*, whilst *M. similis* and *M. interporosa* are different in structure, and may be provisionally placed in the genus *Ceriopora*. A Polyzoön from the same locality previously referred to was further identified with *P. tuberculata*. H. A. N.

Young, John. On the Occurrence of *Saccammina Carteri* (Brady) in the Limestone Series of the Lanarkshire Coal-field. Trans. Geol. Soc. Glasgow, vol. iv. pt. iii. pp. 263–266.

Identifies certain fossils from the second "calmy" limestone of a section near Braidwood, belonging to the Lower Limestone of the Lanarkshire coal-fields, with the organism first found in the Carboniferous Limestone of Northumberland, and described as *Saccammina Carteri*. Some other localities are mentioned where this Foraminifer has been found. G. A. L.

——, and James Armstrong. The Fossils of the Carboniferous Strata of the West of Scotland. Trans. Geol. Soc. Glasgow, vol. iv. pt. iii. pp. 267–281.

Consists of full lists of fossils found in the Robroyston district. The following new species are described—*Loxonema clathratula*, *Macrocheilus semistriatus*, *Murchisonia fimbricarinata*, *Naticopsis Robroystonensis*. Figures of these will be given with the second part of this paper. G. A. L.

See also :—

Jones, Prof. T. R. *Cythere plicata* from London Clay, p. 335.
Zarecznego, Dr. St. Cenomanian Fossils, Galicia, see p. 106.

8. *PLANTS.*

Areitio y Larringa, Alf. de. Enumeracion de las Plantas fosiles Españolas. An. Soc. Españ. Hist. Nat. vol. iii. pt. 2.

Gives a list of 110 species found in the formations of Spain, and classified according to the system of Schimper's 'Traité de Paléontologie végétale.' J. M‘P.

Balfour, Prof. J. H. Remarks on the Fossils exhibited by Mr. Peach which seem to belong to *Staphylopteris*, Lesq. Trans. Bot. Soc. Edin. vol. xii. p. 176.

Refers Mr. Peach's branching fossils with flower-like forms to this genus, and suggests that, if new, it should bear Mr. Peach's name.

Binney, E. W. Note on the *Medullosa elegans* of Cotta. Mem. Lit. & Phil. Soc. Manchester, vol. xiii. p. 99.

In 1872 the author stated he believed this fossil, which occurs in the Upper Brooksbottom Coal of Lancashire, to be the rachis of a fern. The name has been changed by Brongniart to *Myeloxylon*, and again by Renault to *Myelopteris*. There are two species, *M. radiata* and *M. Landriotti*. M. Grand'Eury refers these forms to the *Neuropterideæ*. C. E. De R.

——. A few Observations on Coal. Mem. Lit. & Phil. Soc. Manchester, vol. xiii. p. 125.

In splint and hard coals macrospores are nearly always in abundance; in cannel coals they are sometimes associated with cellular and scalariform portions of plants; in soft coals the mother coal generally shows plenty of structure. In Boghead coal little trace of vegetable tissues is seen under the microscope; nevertheless its yield of paraffin and paraffin oil is larger than in ordinary coals. From the presence of a yellowish-brown substance, like crude paraffin, in the microspores of the upper sporangia of *Lepidostrobus Harcourtii* he was led to believe that the yellow matter seen in the vesicles of the Boghead coal of Bathgate was composed of paraffin, or a similar hydrocarbon. Yellow coal from Fifeshire, with microspores, burnt with a brilliant flame and a smell like burning Boghead coal, while splint coal, with macrospores 320 times as large as the microspores, burnt with an ordinary flame and smell. In cannel coal yielding a brown streak there is a great excess of microspores, and portions of plants long macerated in water. In caking coal there was probably a larger proportion of bark; in splint coal of macrospores. C. E. De R.

——. Note on MM. Renault and Grand'Eury's Memoirs on the Structure of *Sigillaria spinulosa*. Mem. Lit. & Phil. Soc. Manchester, vol. xiv. pp. 13–15.

The absence of the medulla in *Sigillaria* and in its stigmarian roots is due to the speedy decay of the large vascular tubes or utricles of which it was composed. C. E. De R.

Brongniart, Ad. Études sur les graines fossiles trouvées à l'état silicifié dans le terrain houiller de Saint-Étienne. Compt. Rend. vol. lxxviii. pp. 1–20; in full in Ann. Sci. Nat. Bot. sér. 5, vol. xx. (1875).

Reviews the whole of the forms, and groups them into seventeen genera—*Cardiocarpus*, *Rhabdocarpus*, *Diplotesta*, *Sarcotaxus*, *Leptocaryum*, *Taxospermum*, *Pachytesta*, *Trigonocarpus*, *Tripterospermum*, *Ptychotesta*, *Hexapterospermum*, *Polypterospermum*, *Eriotesta*, *Polylophospermum*, *Codonospermum*, *Stephanospermum*, and *Ætheotesta*. W. C.

Castracane, l'Abbé. Sur l'existence des Diatomées dans différentes formations géologiques. [Presence of Diatoms at different geological horizons.] Compt. Rend. t. lxxix. p. 52.

A short *résumé* of two detailed Italian papers. The author found diatoms in every kind of coal examined. He argues thence that all fossil fuels are due to a subaqueous formation very analogous to that of peat. The writer has shown that the Palæozoic Diatomaceæ are indistinguishable specifically from existing forms. G. A. L.

Christison, Sir R. Supplementary notice of the Fossil Trees of Craigleith Quarry. Proc. Roy. Soc. Edin. vol. viii. pp. 241–243.

Gives a list of the stems of trees found, and an account of their mineral condition.

——. Note on the Submerged Fossil Trees of Granton Quarry. Proc. Roy. Soc. Edin. vol. viii. pp. 377, 378.

These specimens agree in structure and mineral condition with those described from beds of the same age and character at Craigleith.

Crépin, François. Description de quelques plantes fossiles de l'étage des Psammites du Condroz (Dévonien supérieur). [Fossil plants from Condroz sandstones (U. Devonian).] Bull. Ac. roy. Belg. 2 sér. t. xxxviii. pp. 356–366, 3 plates.

The new species described are *Psilophyton condrusorum* and *Sphenopteris flaccida*, from Évieux, besides two others.

——. Fragments paléontologiques pour servir à la flore du terrain houiller de Belgique. [Palæontological fragments towards a flora of the Belgian Coal Measures.] Bull. Ac. roy. Belg. 2 sér. t. xxxviii. no. 11, 13 pp., 2 plates.

Two new species, *Pinnularia sphenopteridea* and *Calamostachys equisetiformis*, are figured and described.

Davidson, Rev. G. On a Diatomaceous Deposit in the District of Cromar, Aberdeenshire. Trans. Bot. Soc. Edin. vol. xii. pp. 65, 66.

A list of 83 species of recent freshwater Diatomaceæ.

Dawson, Principal J. W. Note on Fossil Woods from British Columbia collected by Mr. Richardson. Amer. Journ. ser. 3, vol. vii. pp. 47–51.

These specimens are from Mesozoic rocks, associated with shells of Cretaceous or Jurassic genera. Coniferous woods are most abundant, and belong to *Cupressoxylon* and *Taxoxylon*. Besides these there are two species of *Quercus*, one of *Betula*, and one of *Populus*. The fruit and foliage of a Cycad is described under the name *Cycadeocarpus* (*Dioonites*) *Columbianus*.

De Candolle, A. Constitution dans le règne végétal de groupes physiologiques applicables à la géographie botanique ancienne et moderne. [Arrangement of the vegetable kingdom in physiological groups applicable to the botanical geography of fossil and recent plants.] Arch. Sci. Phys. et Nat. pp. 38.

Proposes to group plants in respect of their relation to the external conditions of heat and moisture. Establishes six groups:—1. *Megatherms*, plants requiring great heat and moisture, such as live at present in the tropics in a temperature over 30° Cent. Representative Orders *Anonaceæ*, *Guttiferæ*, *Dipterocarpeæ*, *Begoniaceæ*, *Piperaceæ*, &c. The fossil Megatherms were at first distributed over the globe, but in Tertiary times they were gradually receding towards the Equator. 2. *Xerophils*, plants requiring as much heat as the first group, but less moisture, such as now live in the hot and dry districts from California and Texas to Mexico, from Senegal to Arabia and the Indus, nearly all Australia, the Cape of Good Hope, and the dry regions of La Plata, Chili, Peru, and the Andes. Representative Orders *Zygophyllaceæ*, *Cactaceæ*, *Ficoideæ*, *Cycadeæ*, and *Proteaceæ*. The fossils are but imperfectly known. 3. *Mesotherms*, plants requiring a moderate heat, from 15° to 20° Cent. of mean annual heat, with a moderate amount of humidity. Characteristic Orders *Laurineæ*, *Juglandeæ*, *Ebenaceæ*, *Magnoliaceæ*, *Acerineæ*, &c. The plants of the Mediterranean basin, of the central plain of Asia, the plains of Chili, &c. The early Tertiary floras represent plants of this group. 4. *Microtherms*, plants of temperate climes, with a mean annual heat of 0° to 10° Cent., such as form the flora of Europe. The plants are chiefly herbaceous perennials, and deciduous trees and conifers. 5. *Hekistotherms*, plants which require scarcely any heat, such as those which are found in Arctic and Alpine regions, and are able to endure a long winter. Representative Orders *Musci*, *Lichenes*, *Gramineæ*, *Junceæ*, *Cyperaceæ*, *Cruciferæ*, *Saxifragaceæ*, &c. 6. *Megistotherms*, plants requiring extreme heat, over 30° Cent., represented now by the Algæ of thermal springs, and to which the *Algæ*, *Filices*, *Lycopodiaceæ*, and *Equisetaceæ* of the Carboniferous period belong. The author considers these groups very stable, passing down through the earth's history with little change, while the forms of the plants themselves and the climate have changed; and he believes that if they are employed they will render the facts of botanical geography, affecting fossil as well as recent plants, more precise and more easily grouped on the basis of general laws. W. C.

Erdmann, Edw. Fossila ormbunkar funna i Skånes stenkolsförande formation. [Fossil ferns in the coal-bearing formation of Skania.]

Geol. fören. Stockholm Förhandl. bd. i. pp. 203, 204, fig. 1, pl. xviii.

The specimen figured comes from near Billesholm. No name is given.

Etheridge, R., jun. Note on the further Discovery of a Species of *Pothocites* in the Lower Carboniferous Rocks near West Calder. Trans. Bot. Soc. Edin. vol. xii. pp. 151, 152.

Describes the fossil, and distinguishes it from the species already known by the flowers being arranged on the spadix in six rows instead of nine or ten. He suggests the name *P. Patersoni* for it. W. C.

——. On a new Locality for *Pothocites*. Trans. Bot. Soc. Edin. vol. xii. pp. 162, 163.

A specimen of *P. Patersoni* found at Barnton, near Edinburgh.

Ettingshausen, Prof. C. von. Zur Entwickelungsgeschichte der Vegetation der Erde. [History of the development of the vegetation of the earth.] Sitzungsb. k. Ak. Wiss. math.-nat. classe, Abth. i. Bd. lxix. Heft 3, pp. 219–236.

Considering the present vegetation of the earth as merely a stage in the development of a previously existing flora, the author points to the Tertiary flora as already containing the precursors of recent vegetation. Notices that here were mixed up, *e.g.* at Radoboj (L. Miocene), types which now characterize different continents, and, again, that the Tertiary flora throughout the world was essentially the same, containing in it the elements of all the floras. The present floras retain traces of this admixture; *e.g.* that of Japan has many analogies with that of the southern parts of the United States. In the second part are lists of genera in the European Miocene characteristic of the floras respectively of New Holland, Cape of Good Hope, India, China and Japan, Asiatic steppes, Mediterranean countries, tropical S. America, Mexico, W. Indies, &c. E. B. T.

——. Die Florenelemente in der Kreideflora. [Plant-differentiation in the Cretaceous flora.] Sitzungsb. k. Ak. Wiss., math.-nat. Cl. Abth. i. Bd. lxix. Heft 5, pp. 510–518.

The earlier Cretaceous flora, *e.g.* of Niederschöna (Cenomanian), contains forms of a rather more tropical character than the U. Cretaceous; certain ferns, cycads, palms, the genera *Frenelopsis* and *Eolirion* are peculiar to the earlier stage, while *Sequoia*, *Pinus*, *Populus*, &c. occur in both. The U. Cretaceous flora is more allied to the Tertiary, containing a mixture of temperate with tropical forms, *e.g.* the genera *Quercus*, *Fagus*, *Salix*, *Acer*, *Juglans*, &c. It is held that the Tertiary flora is directly descended from the Cretaceous. The present grouping of plants (flora-elements) is foreshadowed, *e.g.* Brazil forms by *Salvertia*, California by *Sequoia*, China and Japan by *Glyptostrobus*, *Cunninghamia*, *Torreya*, *Salisburia*, and *Cinnamomum*, and Australia by *Grevillea*, *Banksia*, *Dryandra*, &c. A table of the natural orders and chief genera which occur in the lower and upper horizons is added, with their present habitat on the earth. E. B. T.

Feistmantel, Dr. Ottokar. Beitrag zur Kenntniss der Equiseten im Kohlengebirge. [*Equisetaceæ* of the Coal Measures.] N. Jahrb. Heft 4, pp. 362–376, plate.

Reviews the order *Equisetaceæ*, critically examines the genus *Equisetum*, and describes a new species, *E. Schützeanum*, of which two examples are known and figured. F. W. R.

——. [Coal Measures, Bohemia.] N. Jahrb. p. 406. [See p. 62.]

Regards the upper part of the coal-bearing rocks as Rothliegende; the Carboniferous flora, therefore, passes into the Permian. Records a new species, *Equisetum tenuidentatum*, from the Coal Measures of Upper Silesia. F. W. R.

——. Beitrag zur Palaeontologie des Kohlengebirges in Oberschlesien. [Palæontology of the Carboniferous Formation of U. Silesia.] Verh. k.-k. geol. Reichs. pp. 81–85.

Gives a list of 43 species of plants from this formation, which are in the Geol. Mus. of Breslau. He also notices the occurrence of the borings of insects on a decorticated *Sigillaria*. H. A. N.

——. Zur Flora von Miröschau. [Flora of Miröschau.] Verh. k.-k. geol. Reichs. pp. 256, 257.

Letter enumerating 13 species of Carboniferous plants.

——. Ueber das Vorkommen von *Noeggerathia foliosa*, Stbg., in Ober-Schlesien. [Occurrence of *Noeggarathia foliosa*, Sternb., in U. Silesia.] Verh. k.-k. geol. Reichs. pp. 343–345.

From a specimen in Goeppert's collection.

——. Die Versteinerungen der böhmischen Kohlengebirgsablagerungen. [Fossils of the Bohemian Coal Measures.] Palæontographica, vol. xxiii. pp. 1–156, plates i.–xxv.

Enumerates the maps and literature of the subject, the extent of formation, the rocks and minerals occurring in it, and its principal divisions. A table of all the fossils, animal and vegetable, is given, showing their distribution throughout the series, and a description in detail, with extensive lists of synonyms and many figures, of the anomalous genus *Bactryllites*, of one species of *Fungi*, 29 species of *Equisetaceæ*, several of which he, however, correlates as being the stems, foliage, and fruits of the same species, giving drawings of his interpretation of the fruits of *Huttonia* (*Calamites*), *Asterophyllites*, and *Annularia*. The stems of three genera of ferns are also described; but with this exception the ferns and his groups of *Lycopodiaceæ*, *Sigillarieæ*, *Gramineæ*, and *Noeggerathieæ*, together with the separate fruits, have yet to be described. W. C.

Hall, Prof. James, and R. P. Whitfield. Remarks on some peculiar impresssions in Sandstone of the Chemung group, New York. 24th Ann. Rep. S. C. N. York, pp. 201-204. [An *abstract* of this is stated to have been distributed in August, 1869.]

The authors propose the name of *Hippodophycus* for certain large impressions which occur in sandstones of the age of the Chemung group near Salamanca, N. Y., and which closely resemble the foot-prints of an unshod horse. The authors believe these impressions to have been produced by the roots of a marine plant; and they define the genus as follows:—"Marine plants, having swelling roots, which are laterally expanded in the form of a subcircular disk, with one edge truncate, and having the upper and lower surfaces deeply impressed, leaving a thickened rounded rim to form the margin of the disk, except on the truncate portion, where the substance becomes thin and attenuated, and the central depression opens out to the margin." The name *Hippodophycus Cowlesi* is given to the only known species. H. A. N.

Heer, Prof. O. Fossile Pflanzen von Sumatra. [Fossil Plants of Sumatra.] Abh. Schweiz. palaeont. Gesell. vol. i. pp. 1–19, plates i.–iii.

The plants are Tertiary, most probably Miocene. 13 species are described. Two of these species had already been found in Java, and described by Goeppert, *Xylomites stigmariæformis* and *Daphnophyllum Beilechmiedioides*. The others are new, viz. *Casuarina Padangiana*, *Ficus tremula*, *F. Verbeekiana*, *Diospyros Horneri*, *Apocynophyllum Sumatrense*, *Dipterocarpus Verbeekianus*, *Sapindus macrophyllus*, *Rhus bidens*, *Dalbergia grandifolia*, *Carpolithes umbilicatulus*, and *C. radiatus*. W. C.

——. Anmärkningar öfver de af svenska polarexpeditionen 1872–1873 upp.-täckte fossila växter. [Remark on the fossil plants collected by the Swedish Polar expeditions.] Öfver. k. Vet. Akad. Förhandl. no. 1, pp. 25–32.

Helmhacker, R. Beitrage zur Kentniss der Flora des Südrandes der oberschlesisch-polnischen Steinkohlenformation. Jahrb. k.-k. Bergakad. Heft i., and Verh. k.-k. geol. Reichs. p. 44.

Hodges, Prof. On the Petrified Wood of Lough Neagh. Coll. Guard. vol. xxviii. p. 452. [Brit. Assoc.]

As the mineralization of the wood has been popularly attributed to the action of the waters of the lake, the author has analyzed the water taken from several parts, and finds that it contains only an inconsiderable amount of solid matter. He also publishes an analysis of the wood, which shows that the structure has been replaced by silica, and not, as some have maintained, by oxide of iron. One specimen of the wood yielded 89·01, and another 84·5 per cent. of silica. F. W. R.

Jones, Prof. T. R. Gyrogonites, &c., in the London Clay. Geol. dec. 2, vol. i. p. 479.

Mentions the discovery of *Gyrogonites* (seed-vessels of *Chara*) in the London Clay of Islington, associated with Foraminifera and Entomostraca, and referable to two species—one resembling *Chara helicteres*, the other *C. Lyellii*. From the same source Mr. Wright has also added *Cythere plicata*, Münster, to the fauna of the London Clay. W. T.

Lesquereux, Prof. **Leo.** Contributions to the Fossil Flora of the Western Territories. Part I. The Cretaceous Flora. Rep. U.S. Geol. Surv. Territories, vol. vi. pp. 136, 30 plates.

Gives a history of the discovery and literature of the Cretaceous flora of the Dakota group, and of the geographical and stratigraphical distribution of the beds. An examination of the genera and species which compose the flora shows that it is clearly separated from earlier floras, and that, though its facies is that of a Tertiary vegetation, yet it has no relation to the flora of the L. Tertiary of N. America. There are not sufficient plant-remains known from the European Cretaceous deposits to permit a comparison. Describes at length and figures the plant-remains, almost entirely consisting of leaves, which he refers to 72 genera and 130 species. The Cryptogams are represented by one Alga and six Filices (referred to as many genera), seven Gymnosperms (one being a Cycad leaf), three Monocotyledons, and the remainder Dicotyledons, except ten *incertæ sedis*. W. C.

——. The Lignitic Formation and its Fossil Flora. Ann. Rep. U. S. Geol. Surv. Territories, pp. 365–425 (see **Hayden**, p. 118).

Gives the position, ranging from Eocene to U. Miocene, of the various localities where the lignitic formation occurs, and argues that the beds are Tertiary and not Cretaceous, maintaining that the fossil flora has precedence over the fauna in determining the age of the formation. In four tables he gives the distribution of the flora in relation to the four periods which they seem to represent. Then follows a detailed description of the species added to the known flora in this report, of which 60 are new, and, lastly, an inquiry into the light thrown by this ancient flora, now amounting to 360 species, on the climate of the period. The lower period had a temperature between that of Ohio and S. Florida; and it gradually decreased till the fourth period was similar to that of the Black Mountains of Carolina. W. C.

——. Land-plants in L. Silurian and Lignitic formations of Rocky Mountains. See p. 123.

M'Coy, Prof. **Fred.** *Podozamites* and *Lepidodendron*, see p. 310.

Marratt, F. M. Calamites and their alliances, a continuation of a paper on the Fossil Plants in the Liverpool Free Public Museum, collected by the Rev. H. H. Higgins, and known as the Ravenhead Collection, pp. 3. Appended to Proc. Geol. Soc. Liverpool, sess. 15.

A catalogue of 16 species—5 referred to *Calamites*, 5 to *Calamocladus*, 1 to *Bornia*, 2 to *Sphenophyllum*, and 3 to *Annularia*. *Calamocladus tenuis* appears to be considered a new species; but no description is given. W. C.

Mourlon. [Note of the discovery of a gigantic fossil tree in the Maestricht series at Canne, in the *arrondissement* of Tongres (Gd.-Duchy of Limburg).] Proc. Verb. Soc. Mal. Belg. t. iii. pp. lxii, lxiii.

Referred doubtfully to *Cupressinoxylon ucranicum*.

MUELLER, Baron F. VON. Observations on new Vegetable Fossils in the Auriferous Drifts. Geol. Survey of Victoria. 8vo. Melbourne. Plates ix., x. pp. 1–26.

Establishes 11 new genera for fruits belonging to 16 species. These are:—*Spondylostrobus Smithii*, a conifer allied to *Callitris*; *Phymatocaryon Mackayi* and *P. angulare*, perhaps Sapindaceous; *Trematocaryon McLellani*, perhaps Verbenaceous; *Rhytidotheca Lynchii* and *R. pleioclinis*, perhaps Meliaceous; *Plesiocapparis prisca*, like some fruits of *Capparis*; *Celyphina McCoyi*, Proteaceous; *Odontocaryon Macgregorii*, affinities unknown; *Conchotheca rotundata* and *C. turgida*, Proteaceous; *Penteune Clarkei*, *P. brachyclinis*, and *P. trachyclinis*, perhaps Sapindaceous; *Diune pluriovulata*, Capparideous or Pittosporeous; and *Platycoila Sullivani*, affinities unknown. The specimens were found in the deep leads of the older auriferous drifts of Haddon and Beechworth in Victoria, as well as in similar leads both in New South Wales and in Gippsland. The presence of the cones of *Banksia* in the leads had already been determined, and in the clays above the drifts the leaves of *Eucalyptus*, so little changed that they still preserve their fragrance! and trunks of large trees so perfect as to be used, though the surface is invariably carbonized. W. C.

NEWBERRY, Prof. J. S. On the so-called Land Plants from the Lower Silurian of Ohio. Amer. Journ. ser. 3, vol. viii. pp. 110–113.

Gives figures of the two specimens described by Prof. Lesquereux as belonging to *Sigillaria*, and, as they show no structure or spiral arrangement of leaf-scars, concludes that they are rather casts of a Fucoid stem. They are too imperfect to be put down positively as land-plants. E. B. T.

PANTON, GEORGE A. Note on some Fossil Cones from the Airdrie Blackband Ironstones. Trans. Edin. Geol. Soc. vol. ii. part iii. pp. 307, 308.

Notes the occurrence of cones, two of which are indeterminable, whilst the remaining two belong to *Lepidodendron obovatum* and *L. Russelianum*. H. A. N.

PEACH, C. W. Notice of a new Lepidodendroid Fossil from Devonside, Tillicoultry, with remarks on other Fossil Plants. Trans. Bot. Soc. Edin. vol. xii. pp. 99–101.

An account of some peculiarities observed in specimens collected by the author.

——. Notes on some Fossil Plants from the Shales of West Calder. Trans. Bot. Soc. Edin. vol. xii. p. 162.

A branching fossil, bearing flower-like bodies singly or in pairs, is described.

——. Remarks on Specimens of *Ulodendron* and *Halonia* collected by Messrs. Galletly and Lumsden near West Calder. Trans. Bot. Soc. Edin. vol. xii. pp. 174, 175.

Specimens of the two genera are described; and a fossil supposed to be a new species is provisionally named *Ulodendron scoticum*.

Peach, C. W. Remarks on Specimens of some Fossil Plants. Trans. Bot. Soc. Edin. vol. xii. p. 187.

Describes specimens of *Sphenopteris affinis* with circinate vernation and fructification, and with specimens of *Staphylopteris* attached to it, showing, in his opinion, that this new plant was epiphytic on the *Sphenopteris*. W. C.

Saporta, Comte G. de. Paléontologie Française. 2e Série. Végétaux. Terrain Jurassique. Liv. 15–17, pp. 193–288, plates 27–49. 8vo. Paris.

The descriptions of the Cycadean remains are continued; 21 species belonging to 10 genera are described, the following being new—*Cycadorachis* (new gen) *armata*, *C. abscissa*, *Cycadolepis* (new gen.) *villosa*, *C. hirta*, *Zamiostrobus Ponceleti*, *Cycadeospermum* (new gen.) *Wimillense*, *C. Schlumbergeri*, *Bulbopodium* (new gen.) *micromerum*, *Cylindropodium* (new gen.), *Platylepis* (new gen.) *impressa*, *Clathropodium* (new gen.). W. C.

Saporta, Comte Gaston de, et A. F. Marion. Sur les couches supérieures à la Mollasse du bassin de Théziers (Gard) et les plantes fossiles de Vaquières. [Beds above the Mollasse of the Théziers Basin (Gard), and the fossil plants of Vaquières.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 272–287, plates vii. & viii., 2 figs. in text.

The supra-molassic beds of Théziers consist of the fluvio-marine group of Théziers, lying conformably upon the Miocene marine mollasse, and of the marine and fluviatile group of Vaquières-Saint-Amand, which seems to lie unconformably upon the last. From this second series the authors have obtained a considerable number of plant-remains, of which a descriptive list is given. The new species described are *Arundo Ægyptia antiqua*, *Alnus stenophylla*, *Viburnum assimile*, *V. palæomorphum*, *Coriaria lanceolata*, *Celastrus gardonensis*. G. A. L.

Schimper, Prof. W. Ph. Traité de Paléontologie Végétale. Vol. iii. 8vo. Atlas, 20 plates. 4to. Paris.

The completion of his systematic account of the Fossil Plants of the world. Contains the *Ericaceæ*, the last tribe of Monopetalæ in his arrangement, and the whole of the Polypetalæ. A supplement of about 200 pages contains the additional species met with in the progress of the work. A general view of the floras of the different periods, a list of books and memoirs on fossil botany, and two extensive indices complete the volume. W. C.

Sordelli, F. Descrizione di alcuni avanzi vegetali delle argille plioceniche Lombarde, &c. Att. Soc. Ital. Sci. Nat. vol. xvi. p. 350, plates.

Stur, D. *Odontopteris obliqua*, Brongn. sp. von Sulzbach bei Saarbrücken in der Sammlung des k.-k. Hof-Mineraliencabinetes in Wien. [*Odontopteris obliqua* from Sulzbach, near Saarbrück, in the Imp. Geol. Mus. Vienna.] Verh. k.-k. geol. Reichs. p. 80.

Description of a fine specimen in the Museum, named *Neuropteris tenuifolia*.

——. *Neuropteris macrophylla*, Brongn., aus England in der Sammlung der k.-k. Hof-Mineraliencabinetes in Wien. [*Neuropteris macrophylla* from England in the Imp. Geol. Mus. Vienna.] Verh. k.-k. geol. Reichs. p. 81.

Mere notice of the specimen.

——. Joh. Boeckh: Neueste Ausbeute an fossilen Pflanzen-Resten in der Umgegend von Fünfkirchen. [The most recent collections of fossil plants from the neighbourhood of Fünfkirchen, collected by Joh. Boeckh.] Verh. k.-k. geol. Reichs. pp. 115–118.

Gives notes on the fossil plants. The deposits belong partly to the L. Lias, and partly to beds between the L. Lias and the Muschelkalk.

——. Reise-Skizzen. [Travelling Notes.] Verh. k.-k. geol. Reichs. pp. 135–138 and 293–305.

Contains notes on the Museum at Dresden, and several corrections of published species of fossil plants from an examination of the type specimens. W. C.

——. *Macrostachya gracilis*, Sternb. sp., Fruchtähre, Stamm, und Blätter. [*Macrostachya gracilis*, fructification, stem, and leaves.] Verh. k.-k. geol. Reichs. pp. 257–262.

This fruit is considered to belong to a species of *Calamites* with a forked leaf.

——. *Odontopteris bifurcata*, St. sp. aus dem gräflich Nostitz'schen Kohlenbau in Lubna bei Rakonitz. [*Odontopteris bifurcata* from the colliery at Lubna, near Rakonitz.] Verh. k.-k. geol. Reichs. pp. 262–266.

An examination of the history and synonymy of this species.

——. Ueber die Flora der Konnover Schichten. [Flora of the "Konnover beds."] Verh. k.-k. geol. Reichs. pp. 267–269.

Gives a list of 8 species of Carboniferous plants.

——. Einiges über Sphenopteriden der sächsischen Steinkohlenformation. [The species of *Sphenopteris* in the Carboniferous formation of Saxony.] Verh. k.-k. geol. Reichs. pp. 311–318.

A critical examination of the specimens of this genus contained in the Town Museum of Zwickau, Saxony.

Wiesbaur, J. Fossile Pflanzen in marinen Tertiär-Conglomerate zu Kalksburg bei Wien. [Fossil plants in the marine Tertiary Conglomerate of Kalksburg, near Vienna.] Verh. k.-k. geol. Reichs. pp. 157–166.

Describes the vegetable remains, and briefly notices in an appendix the more remarkable animal fossils.

WILLIAMSON, Prof. W. C. Primeval Vegetation in its relation to the Doctrines of Natural Selection and Evolution. Essays and Addresses by Professors of Owen's College. 8vo. London. Pp. 199–255.

A summary of the successive stages of terrestrial plant-life is given; and the author shows that the known facts are opposed to the doctrine of evolution, but that they indicate the operation of some as yet unknown factor in the production of the new forms which successively appeared. W. C.

——. On Fern stems and petioles in the Coal Measures. Rep. Brit. Assoc. for 1873, Sections, p. 106.

Considers his *Edraxylon* to be the petiole of a *Pecopteris*, his *Heterangium Grievii* probably a fern, and Corda's *Palmacites* to be a Marattiaceous fern. W. C.

——. On the Organization of the Fossil Plants of the Coal Measures. —Part V. Asterophyllites. Phil. Trans. vol. clxiv. pp. 41–81, plates i.–ix.

The minute structure of stems, roots, and leaves belonging to this genus are described; the structure of the cone described as *Volkmannia Binneyi*, Carr., is investigated; and reasons are adduced for believing it to belong to the same genus, to which *Sphenophyllum* is closely related; and the author believes that these two fossils are Lycopodiaceous plants, and not related to *Calamites*, as has been heretofore generally maintained. W. C.

——. On the Organization of the Fossil Plants of the Coal Measures.—Part VI. Ferns. Phil. Trans. vol. clxiv. pp. 675–703, plates li.–lviii.

An elaborate account of specimens referred by the author to the petioles of ferns, and described as *Rachiopteris aspera*, *R. Oldhamia*, *R. duplex*, *R. Lacattii*, *R. bibractiensis*, and *Anachoropteris Decaisnii*. W. C.

——. On the Structure of *Stigmaria*. Mem. Lit. Phil. Soc. Manchester, vol xiv. pp. 45–50.

Maintains that the centre of the axis was entirely cellular, that the vascular bundles to the rootlets spring from the wedges of the vascular cylinder, and that the free bundles noticed by Goeppert in the axis belong to rootlets foreign to the *Stigmaria*. W. C.

——. On Coal and Coal Plants. Macmillan's Magazine, vol. xxix. pp. 404–417.

A popular exposition of the author's views on the structure of coal, and the nature of the plants growing on the earth at the time it was formed. W. C.

MAPS AND SECTIONS.

Antrim. Sheet 41 of the Geological-Survey Map (Ireland). Scale 6 inches to the mile. By G. V. Du Noyer, and W. E. L'E. Duffin.

Includes the country enclosing part of Lough Larne, and extending along the sea-coast by Ferris Bay, Barr's Point, Skernaghan Point, Portmuck Bay, and the Isle of Muck. The following formations are shown:—Blown Sand, Alluvium, Raised Beach, Drift, Chalk, U. Greensand, L. Lias and Rhætic Beds, Keuper Marls (with gypsum), U. and L. Divisions of the Basaltic Series, with intercalated beds of Pisolitic iron-ore, bole and lithomarge, and Volcanic Breccia and Ash, with basaltic dykes. The greater part of the district consists of the lower divisions of the Basalt. This is the first 6-inch sheet that has been published by the Geological Survey of Ireland. E. T. H.

Cambridge. Geological Map of the Neighbourhood of. By A. J. Jukes-Browne.

This map is sheet 51, S.W. of the Ordnance Map (on the scale of an inch to a mile), geologically coloured, and is to some extent founded on the similar one by L. Barrett, published in 1859. The formations shown are Boulder Clay, U. and L. Chalk, U. Greensand, Gault, L. Greensand, Kimmeridge Clay, and Oxford Clay, the most important point being the outcrop of the Cambridge Greensand, which runs very irregularly across the district from S.W. to N.E. W. W.

Cape Colony. Geological Sketch Map of, compiled by E. J. Dunn. Scale about 23 miles to an inch. London.

The formations shown are Glacial Conglomerate, Tertiary, Oolitic? (Enon Conglomerate and Sunday-River Beds), Triassic (in 3 divisions), Carboniferous, U. and L. Devonian, Silurian, Namaqualand Schist (metamorphic), Gneiss, Granite, and Trap-conglomerate, besides dioritic and doleritic dykes. Local names are given to the various beds. W. W.

Chattanooga and the Vicinity. Map of the Mineral Resources of. New York.

Corrèze. Atlas topographique, agricole et géologique du département de la. In parts. Paris.

Dumbartonshire. 6 Sheets of the Geological-Survey Map (Scotland). Scale 6 inches to a mile.

Sheet 19A. By B. N. Peach. Croy Hill and Dullatur. Carboniferous Limestone, Intrusive Sheets and Dykes of Basalt-rock, Boulder Clay, and Alluvium.

Sheet 20. By B. N. PEACH. Castlecary Railway Station. Carboniferous Limestone, with dyke of Basaltic rock, Millstone Grit, Boulder Clay, Alluvium. Outcrops of Castlecary and Calmy Limestones and Hirst Coals—a Coal Seam in Millstone Grit.

Sheet 23. By R. L. JACK. Garscadden and part of the Kilpatrick Hills. Contemporaneous (L. Carboniferous) Porphyrites and Ashes, with "Necks," Carboniferous Limestone with intrusive Basaltic rocks, Boulder Clay, Gravel, Peat, Alluvium. Stratified rocks at the Slacks intercalated among the igneous rocks of the Kilpatrick Hills; conglomerates of Douglas Muir at the base of the Carboniferous Limestone series, overlying the Traps; outcrops of the Main (Hurlet) Limestone and Coal, the Garscadden Blackbands, &c.; portion of a line of deep Drift deposits extending from the Clyde, near Bowling to the Forth at Grangemouth.

Sheet 24. By R. L. JACK. Kirkintilloch. Millstone Grit, Carboniferous Limestone, Boulder Clay, Gravel, Peat, Alluvium.

Sheet 25. By B. N. PEACH and R. L. JACK. Gartshore and Conporrat. Carboniferous Limestone, with intrusive Basaltic rocks in sheets and dykes, Millstone Grit, Boulder Clay, Gravel, Peat, Alluvium. Outcrops of Castlecary, Calmy or Arden, and Index or Cowglen Limestones, Meiklehill and Shirva Coals and Gartshore Ironstones. Remarkable anticlinal axis known as the "Rigging;" number of Peat Mosses and Alluvial patches, indicating silted-up lakelets.

Sheet 26. Dumbarton. By B. N. PEACH. Cumbernauld, Fannyside Loch. Carboniferous Limestone, Millstone Grit, Coal Measures, with Basaltic dykes; Boulder Clay, Peat, Alluvium. Outcrops of Calmy and Castlecary Limestones, Shirva Coals, and Slatyband Ironstone. R. L. J.

England and Wales. Geological Relievo-map of. By H. F. BRION. The geology from Sir R. Murchison. Scale of map about 26 miles to an inch. Vertical scale much exaggerated.

——. 3 Quarter-sheets of the Geological-Survey Map. Scale an inch to a mile.

Sheet 88, N.E. By A. H. GREEN, J. R. DAKYNS, J. C. WARD, and R. RUSSELL. Halifax, Huddersfield, Dewsbury. The beds shown are Alluvium, Brickearth and Gravel (along the valleys), Coal Measures and Millstone Grit, the last two with very many divisions (flagstones, shales, sandstones, &c. being distinguished). Many outcrops of coals and ironstones are marked, and a multitude of faults and dips.

Sheet 92, S.W. New Edition.

Sheet 93, N.W. (not issued until 1874, though dated 1873). By W. T. AVELINE, J. R. DAKYNS, and C. F. STRANGWAYS. Knaresborough, Ripley, Boroughbridge, Easingwold. The beds shown are Alluvium, River-terraces, Warp &c., Post-glacial Gravel and Sand, Marlstone, Keuper and Bunter, Magnesian Limestone and Marls, Millstone Grit and Yoredale Rocks, the last two with many divisions (shales and grits). There are some faults in the Carboniferous and Permian rocks. W. W.

England and Wales. 3 Sheets of the Vertical Sections of the Geological Survey. Scale 40 feet to an inch.

Sheet 28. Sections of the Millstone Grit, Yoredale Beds, and Carboniferous Limestone, of Grassington Moor and Kettlewell. By J. R. Dakyns. 10 sections, in 6 of which the connexion of the beds is shown, and a map marking the positions of the sections.

Sheet 54. Sections of the Northumberland Coal-field, between the Rivers Lyne and Wansbeck. By W. Topley. 11 sections, with an Index Map showing their positions.

Sheet 57. Sections of the Coal Measures of the South Wales Basins from Glyncorrwg Fault to Pembrey Bar Fault, South of Anticlinal. Showing Relative Position and Average Thickness of each Coal Seam. By E. Daniel. One continuous section of over 6300 feet, arranged from material in the Report of the Royal Coal Commission. W. W.

Erzgebirge. Map of the Coalfields of the Lower. 4 sheets (with text). Zwickau.

France. Carte agricole de la France. [Agricultural Map of France.] By A. Delesse. Paris. 24 sheets, with a small map (coloured), on a scale of 1:4,000,000.

Geological to a great extent.

Gard. Carte géologique du Département du. Arrondissement d'Alais, and Arrondissement d'Uzès. By Emilien Dumas. Paris.

Heidelberg. Geologische Karte der Umgegend von Heidelberg. [Geological map of the neighbourhood of Heidelberg.] 2nd sheet, Sinsheim. By E. W. Benecke and E. C. Cohen. Strassburg.

Ireland. 5 Sheets of the Geological-Survey Map. Scale an inch to a mile.

Sheet 28. By G. V. Du Noyer, and W. E. L'E. Duffin. Part of County Antrim. (Antrim, Randalstown, Ballyclare, Templepatrick, Ballynure, Legoniel.) The area is between the north-eastern corner of Lough Neagh and the sea-shore, north of Belfast. The formations shown are:—*Aqueous.* Recent deposits, Drift, Chalk, U. Greensand, L. Lias and Rhætic Beds, Keuper Marl with gypsum, U. Bunter Sandstone. *Volcanic.* 1. Eocene?, Trachyte, Trachyte-porphyry, Rhyolite and Pitchstone-porphyry. [These, with another, but small, exposure near Fort William, County Down, are the only examples of such rocks known in the British Isles.] 2. Miocene. Basalt. The greater part of the area is of this rock, here divided into an upper and a lower flow, having between them in places the well-known Pisolitic iron-ore, and lithomarge. These are now mapped for the first time. Volcanic ash beds are shown in various places. 3. Dykes, &c. A number are shown on the shore penetrating the Triassic rocks, and in other places. At Carnmoney Hill a supposed volcanic neck of Miocene age is marked. This is the first hill-shaded map published by the Geological Survey of Ireland.

Sheet 76. By RICHARD SYMES and S. B. WILKINSON. Contains parts of the counties Mayo and Roscommon (Ballaghadereen, Kilkelly, and Kiltamagh). The formations represented are:—*Aqueous, &c.* Bog and Alluvium, Drift, Carboniferous Limestone, L. Carboniferous Sandstone, Old Red Sandstone, Wenlock, U. Llandovery. *Igneous.* Basalt (dyke) Quartziferous Porphyry, Felstone, Melaphyre, or Diabase, Felspathic Ash, which occur in dykes or masses. The north-east and north centre are occupied by the older Palæozoic and the Igneous rocks, and the remainder of the sheet by the Carboniferous beds. Bog and Alluvium occupy a large area in detached patches. Glacial striations are scarce.

Sheet 80. By W. B. LEONARD. Contains part of Cavan and Meath, with a small portion of Monaghan (Ballyjamesduff, Bailieborough, Kingscourt, Virginia, Moynalty, Oldcourt and Lough Ramor). The formations shown are Bog, Alluvium, Drift, Yoredale Beds, U. Carboniferous Limestone, Calp Limestone, L. Limestone, with grits, L. Silurian (Llandeilo and Bala Beds). The greater part of the area is occupied by Silurian rocks. The Carboniferous beds show in two patches at the south-east and south-west, with a thin strip on the east. The lowest ground occurs to the south. Glacial markings are shown in several places.

Sheet 83. By G. H. KINAHAN, R. G. SYMES, J. L. WARREN, S. B. WILKINSON, and H. LEONARD. Contains two narrow strips of ground extending north and west from the mouth of Killary Harbour on the west coast of Galway and Mayo, and also several islands in the Atlantic. The following formations are shown—Bog and Alluvium, Blown Sands, Drift, U. and L. Silurian (Salrock beds, Mweelrea beds), including Schist, Gneiss, Schistose limestone, Quartz-schist and Quartzite, Felstone-porphyry, Dolerite (Melaphyre), Diorite, Diabase, Hornblende-rock, Serpentine or Steatite. The geology is much complicated, and the rocks greatly faulted. Copper and Iron Pyrites deposits are indicated, also glacial markings.

Sheet 84. By G. H. KINAHAN, R. G. SYMES, J. L. WARREN, S. B. WILKINSON, J. NOLAN, and H. LEONARD. Includes the parts of Mayo and Galway to the east of the last, and comprises the country around Killary Harbour, Doo Lough and part of the western shore of Lough-Mask, &c. The following formations are shown—Peat Bog, Alluvium, Raised Beaches, Drift, Carboniferous Limestone, Carboniferous Sandstone, U. Silurian (Salrock beds, ? Ludlow; Mweelrea beds ? Wenlock, U. Llandovery), L. Silurian, (Doolough beds, Mica-schist, Hornblende-schist, Quartzite, and Dolomite), Serpentine after Dolomite, Serpentine, Dolerite or Melaphyre, and Diabase, Felstones, intrusive and interbedded, and Felstone-porphyry, Quartziferous porphyry (Elvanite), Felspathic Ash, Diorite, Syenite, Hornblende-rock, Granite (intrusive). The northern half of the map shows Metamorphic rocks with small patches of Granite, L. Silurian, and Carboniferous rocks. The southern half is mostly in U. Silurian rocks. Copper, lead, and iron-pyrites deposits are indicated, also Glacial markings. The country is cut up by a multitude of small faults. E. T. H.

Ireland. 2 Sheets of the Longitudinal Sections of the Geological Survey. Scale 6 inches to a mile.

Sheet 23. By W. A. Traill. No. 1, across the Mourne Mountains and Slieve Croob to Lough Neagh. No. 2, from Warren Point across the Mourne Mountains to the sea at Newcastle. General direction from W.S.W. to E.N.E. Length 18 miles.

No. 1 is continued from Sheet 22, and comprises the low ground between Moira and the edge of Lough Neagh, near Derrymore. The formations shown are Bog, Alluvium, Drift, Chalk, Gravel, Greensand, Keuper Marls, and Basalt in sheets and dykes. No. 2 shows the high ground of the Mourne range, chiefly granite with patches of L. Silurian. In the lower grounds N.E. and S.W. these rocks rest against the flanks of the hills, and continue uninterruptedly to the ends of the section. The following formations are shown—Bog, Alluvium, Drift, L. Silurian (Caradoc or Bala beds), Basalt (tabular and intrusive), Granite (intrusive), Felstone or Quartziferous Porphyry.

Sheet 24. By W. A. Traill. No. 1, from Soldiers Point, at entrance to Carlingford Lough, across the Mourne Mountains to the sea at Newcastle. General direction S.S.W. to N.N.E.; length 16 miles. Shows the Limestone at Carlingford resting on L. Silurian rocks, which in turn rest on the flanks of the Mourne Mountains, and are again seen at the other end of the section. The formations shown are Drift, Carboniferous Limestone, L. Silurian, Granite, Basalt (tabular and intrusive), Felstone and Quartziferous Porphyry. No. 2, from Killinchy across Scrabo Hill to the sea at Cultra. General direction S.S.E. to N.N.W.; length 15 miles, over comparatively low ground. The following formations are shown—Alluvium, Bog, Drift, Trias (Keuper and Bunter), Permian (Magnesian Limestone), Carboniferous Limestone, L. Silurian, Basalt (tabular and intrusive). E. T. H.

Isle of Wight, Relievo Map of. By H. F. Brion. The geology from the Geological-Survey Map. Scale (of map) 3 miles to an inch.

Lanarkshire. 13 Sheets of the Geological-Survey Map (Scotland). Scale 6 inches to a mile.

Sheet 2. By James Geikie. (Chryston and Mollinburn.) Carboniferous Limestone, Millstone Grit, Intrusive Basaltic rocks in sheets and dykes, Boulder Clay, Gravel, Alluvium, and Peat.

Sheet 3. By James Geikie. (Greengairs.) Carboniferous Limestone, Millstone Grit, Coal Measures with dykes of Basaltic rock, Boulder Clay, Peat, Alluvium. Outcrops of many coal and ironstone seams in the Coal Measures; large dyke of Basaltic rock occupying a line of fault.

Sheet 4. By James Geikie. (Auchingray and Blackloch.) Coal Measures with dyke of Basaltic rock, Boulder Clay, Peat, Alluvium.

Sheet 7. By James Geikie. (Shettlerton; Coatbridge.) Carboniferous Limestone, Millstone Grit, Coal Measures capped by the unconformable red beds, Intrusive Basaltic rocks in sheets and dykes, Boulder Clay, Gravel, Stratified Clays, Peat, Alluvium. Outcrops of coal-seams, of a limestone in the Coal Measures at Hogganfield Loch. Several alluvial patches indicating silted-up lakelets in Drift.

Sheet 8. By James Geikie. (Airdrie.) Millstone Grit, Coal Measures with the unconformable red beds, Intrusive Basaltic rock in sheets, Boulder Clay, Peat, Alluvium. Outcrops of coals and ironstones. Coal-field much faulted.

Sheet 9. By James Geikie. (Kirk of Shotts; Harthill.) Coal Measures, Intrusive Basaltic rock in sheets, Boulder Clay, Gravel, Peat, Alluvium. Outcrops of several coal-seams. Old water-course (below the Boulder Clay) filled with sand.

Sheet 11. By E. Hull and J. Geikie. (Bothwell.) Bedded melaphyres, porphyrites, and tuffs (L. Carboniferous), Carboniferous Limestone, Coal Measures with the unconformable red beds, Basaltic rock in dykes, Boulder Clay, Gravel, Brick-clay, Peat, Alluvium. Outcrops of coal-seams.

Sheet 12. By James Geikie. (Motherwell; Newarthill.) Millstone Grit, Coal Measures with the unconformable red beds, Intrusive Basaltic rocks, Boulder Clay, Gravel, Alluvium. Outcrops of coals and ironstones. Coal-field much faulted. Pre- and interglacial river-courses traced for several miles in the Coal-workings.

Sheet 17. By James Geikie. (Hamilton; East Kilbride.) Interbedded melaphyres and porphyrites, with ashy shales, grits, and conglomerates (L. Carboniferous), Carboniferous Limestone, Millstone Grit, Coal Measures with the unconformable red beds, Intrusive Basaltic rocks, Boulder Clay, Gravel, Peat, Alluvium.

Sheet 18. By James Geikie. (Wishaw.) Carboniferous Limestone, Millstone Grit, Coal Measures with the unconformable red beds, Intrusive Basaltic rocks in sheets and dykes, Boulder Clay, Gravel, Peat, Alluvium. Outcrops of limestone, coal, and ironstone. Coal-field very much faulted. Interglacial river courses.

Sheet 19. By James Geikie. (Carluke.) Old Red Sandstone, Calciferous Sandstone, Carboniferous Limestone, Millstone Grit, Coal Measures, Intrusive Felstones and Basaltic rocks, Agglomerate Necks of Permian age, Boulder Clay, Peat, Alluvium. Outcrops of limestones, ironstones, &c., in the Carboniferous Limestone series at Carluke, and of coal and ironstone seams in Millstone Grit and Coal Measures.

Sheet 23. By James Geikie. (Strathavon.) L. Old Red Sandstone, L. Carboniferous bedded melaphyres, porphyrites, &c., with tufaceous shales, grits, and conglomerates, Carboniferous Limestone, Coal Measures, Intrusive Basaltic rocks, Boulder Clay, Gravel, Peat, Alluvium.

Sheet 25. By James Geikie. (Lanark; Braidwood.) L. Old Red Sandstone, Calciferous Sandstone, Carboniferous Limestone, Millstone

Grit, Coal Measures, Intrusive Felstones and Basaltic rocks, Agglomerate Necks, Boulder Clay, Gravel, Peat, Alluvium. Outcrops of limestones in the Carboniferous Limestone Series. Falls of the Clyde in Old Red Sandstone. R. L. J.

Lancashire. 4 Sheets of the Map of the Geological Survey (England). Scale 6 inches to a mile.

Sheet 47. By R. H. TIDDEMAN. (Clitheroe, Chatburn, Downham.) The beds shown are Alluvium, River Terrace, Glacial Drift, Permian, Yoredale Rocks (in 5 divisions), and Carboniferous Limestone. A few faults and mineral veins are marked.

Sheet 55. By E. HULL and R. H. TIDDEMAN. (Whalley, Sabden, Padiham.) The beds shown are Alluvium, U. and L. Boulder Clays, with sand and gravel between, M. and L. Coal Measures, Millstone Grit (in 7 divisions of grits and shales), and Yoredale Rocks (in 7 divisions of shales, grits, and limestone). Some coal-crops, faults, and a lead-vein are marked.

Sheet 62. New Edition.

Sheet 63. New Edition. With additions by C. E. DE RANCE. (Accrington, &c.) Various divisions of the Carboniferous Rocks. W. W.

London and its Environs. Geological-Survey Map. Scale an inch to a mile. New Edition, with Drift. By H. W. BRISTOW, W. WHITAKER, T. R. POLWHELE, W. B. DAWKINS, W. H. PENNING, H. B. WOODWARD, F. J. BENNETT, W. A. E. USSHER, J. H. BLAKE, and C. E. HAWKINS.

Includes the valley of the Thames from Windsor to Gravesend. Was published previously without the Drift-beds, which are now added (many divisions). An electrotype from 7 separate plates, combined so as to get London in the centre. W. W.

New Zealand. Geological Sketch Map. By Dr. JAMES HECTOR. Constructed from Official Surveys and the Explorations of Dr. F. v. Hochstetter, Dr. J. Haast, and others. Wellington, 1873 (but not published until 1874). Scale 1 : 2,000,000 (about 33·31 miles to an inch). With 7 Explanatory Sections, and a Table of the Estimated Area and Surface Characteristics of the Principal Formations.

The formations shown are Recent Drift Formation, Marine Tertiary (Pliocene to Cretaceous), Coal Formation (Miocene to Cretaceous), U. Mesozoic (Jurassic), L. Mesozoic (Triassic), U. Palæozoic, Metamorphic Rocks (Foliated Schists and Crystalline), Igneous Rocks (Acidic, Basic, and Plutonic). Gold-workings and metalliferous lodes and veins are marked. This map is compiled from the work of the Geological Survey under Dr. Hector. W. W.

Northumberland. Sheet 102 of the Map of the Geological Survey. Scale 6 inches to a mile. By D. BURNS. Allendale Town, Catton.

The beds shown are Alluvium and River Gravel, Gravel and Boulder Clay; Millstone Grit (5 divisions of grit and shale), and Yoredale Rocks (with various beds of shale, stone, coal, and limestone). Many faults are marked. W. W.

Prussia. Geologische Karte von Preussen und den Thüringischen Staaten. Scale 1 : 25,000. 5 Lief. 3 sheets. Berlin.

245. Gröbzig. Shows:—Coal Measures, 2 divisions; Rothliegende, 3 divisions; Zechstein, 4 divisions; Bunter, 3 divisions; Marine Tertiary; Drift, 4 divisions; Alluvium, &c., 6 divisions; Eruptive rocks, 3 divisions.

246. Zörbig. Shows:—Drift, 4 divisions; Alluvium &c., 5 divisions; Eruptive porphyry.

263. Petersberg. Shows:—Coal Measures; Rothliegende, 3 divisions; Zechstein, 5 divisions; Bunter, 8 divisions; Muschelkalk, 5 divisions; Tertiary brown-coal deposits, 5 divisions; Marine Tertiary, 3 divisions; Drift, 3 divisions; Alluvium, 13 divisions; Eruptive rocks, 4 divisions. In all 50 different colours or tints. W. W.

Prussian Provinces. Geologische Karte der Provinz Preussen. [Geological map.] 9th section: Pilkallen. By G. Berendt. Berlin.

Renfrewshire. 2 Sheets of the Geological-Survey Map (Scotland). Scale 6 inches to a mile.

Sheet 14. By R. L. Jack. Glenlora, near Lochwinnock. Melaphyres, Porphyrites and ashes underlying the Carboniferous Limestone Series, dykes of Basaltic rock, Boulder Clay, Peat, and Alluvium. Outcrops of the main limestone (split up into thin beds), of the Kilburnie Ironstones, and of thin coal-seams.

Sheet 15. By J. Geikie and R. L. Jack. Lochwinnock and Lochlibo. Melaphyres, &c., underlying Carboniferous Limestone, Boulder Clay, Gravel, Peat, and Alluvium. R. L. J.

Rhone et la Saône, Croquis des terrains compris entre le. Lyons.

Scotland. Sheet 4 of the Vertical Sections of the Geological Survey. Scale 40 feet to an inch. Illustrative of the Coal-fields of the Clyde Basin. Arranged by James Geikie and R. L. Jack.

No. 1 shows the general succession of the beds from the U. Red Sandstone Series down to the base of the Calciferous Sandstone Series (3862 feet). No. 2 shows the general succession from the U. Red Sandstone Series down to the base of the Carboniferous Limestone Series (3839 feet). R. L. J.

Seine-et-Marne, Carte hydrologique du Département de. By A. Delesse. 1864–1873 [? published in 1874]. Scale $\frac{1}{100000}$. 2 sheets. Paris.

Stirlingshire. Sheet 36 of the Geological-Survey Map (Scotland). Scale 6 inches to a mile. By B. N. Peach.

Between Torphichen and Slamannan. Millstone Grit, Coal Measures, dykes of Basaltic rock, Boulder Clay, Peat, and Alluvium.

Sweden. Geologiska undersökning. [Geological Survey.] 4 sheets. Scale $1_{\circ}$: 50,000. Stockholm [printed 1873, but issued 1874].

No. 50. Ârsta. By L. PALMGREN, A. PETTERSSON, G. GELLERSTEDT, C. LULIN, and K. FREDHOLM. The formations are:—Postglacial, in 7 divisions; Glacial, in 3 divisions. Limestone, Grey and red gneisses, Garnet- and graphite-gneiss; Diorite; Stockholm granite; Pegmatite.

No. 51. Nynäs. By L. PALMGREN. The formations are:—Postglacial, in 6 divisions; Glacial, in 3 divisions. Limestone, Eurite and mica-schist, Grey and red gneisses, Garnet- and graphite-gneiss, Pegmatite.

No. 52. Trosa. By D. HUMMEL and L. PALMGREN. The formations are:—Postglacial, in 7 divisions; Glacial, in 2 divisions. Limestone, Eurite and eurite-quartzite, Garnet-gneiss, Hornblende-gneiss, Grey and red gneisses, Diabase and hyperite, Stockholm granite, Pegmatite, Quartz, Diorite.

No. 53. Björksund. By M. STOLPE. The formations are:—Postglacial, in 5 divisions; Glacial, in 2 divisions. Eurite, Limestone, Diabase, Garnet-gneiss, Red and grey gneisses, Pegmatite, Granite. W. W.

Switzerland. Beiträge zur geologische Karte der Schweiz, 13^{e} Lief. die Sentis-Gruppe. (2 geol. maps and 2 sheets of sections.) By ARNOLD ESCHER VON DER LINTH. Commission géologique Suisse. Berne.

Texas, Latest Map of the State of. By Dr. A. R. ROESSLER. Scale 20 miles to an inch. With small map (70 miles to an inch) "showing agricultural districts and varieties of soils." There is also a Table of "principal minerals, rocks," &c. New York.

Tyrone. 3 Sheets of the Geological-Survey Map (Ireland). Scale 6 inches to a mile. By EDWARD T. HARDMAN.

These sheets represent the greater part of the Dungannon Coal Field, with some of the surrounding country.

Sheet 47 shows the country around Coalisland, and takes in a part of the W. shore of Lough Neagh. There are 9 formations:—*Aqueous, &c.* Freshwater Shingle, Recent Deposits, Drift (U. and L. Boulder Clay, and Middle Sands, &c.), Pliocene Clays with lignite, &c., Chalk, U. Bunter Sandstone, Coal Measures, Carboniferous Limestone. *Volcanic.* Miocene Basalt. A portion of the basaltic sheet comes into the northern part of the map, with a small patch on the borders of the coal-field. Two basaltic dykes are marked.

Sheet 54. This extends to the west of Sheet 55, and includes the country around the town of Dungannon. The formations shown are:—*Aqueous, &c.* Recent Deposits, Drift, U. Bunter Sandstone, L. Coal Measures, Millstone Grit, Yoredale Beds, Carboniferous Limestone with interbedded sandstones. *Volcanic.* Two small basaltic dykes. The Coal Measures form the southern boundary of the coal-field, and contain two coal-seams—the "Main Coal" (4 to 6 feet thick), and the "Lower Coal" (1 to 2 feet). They extend to the eastward beneath the

Bunter Sandstone. On this, as well as on Sheet 55, the dimensions of the Drift are shown by wide or close dotting.

Sheet 55 forms the continuation to the south of Sheet 47, and extends on the east along the river Blackwater, just reaching the margin of Lough Neagh. The formations included are:—*Aqueous, &c.* Recent Deposits, Drift, Pliocene Clays, &c., Triassic, L. Carboniferous. *Volcanic.* Basalt, of Tertiary (probably Miocene) age. These are all of similar character to the rocks in sheet 47. E. T. H.

Ural, Middle. Geologische Uebersichtskarte vom mittleren oder erzreichen Ural. Nach den neuesten Quelle. By FRANZ TOULA.

A Map prepared after a visit to the Urals. It shows the following formations—Quaternary, Tertiary, Trias, Permian, Carboniferous, Devonian, and Silurian, with crystalline slates, granites, syenites, and greenstones. It also shows the position of beds of coal and salt, gold-washings, platinum-washings, diamond-localities, and smelting works. F. W. R.

Vienna. Geologische Karte der Umgebung Wiens. [Geological map of the environs of Vienna.] By THEODOR FUCHS.

Printed in colours. With separate explanation, a table, and three plates of sections.

Vivarais, Carte archéologique du. [Archæological map of the Vivarais.] By — OLLIER DE MARICHARD. Compt. Rend. 2 sess. Assoc. Franç. pl. xiii.

A small geological map of the district, on which the archæological information is printed in red.

Yorkshire. 3 Sheets of the Map of the Geological Survey (England). Scale 6 inches to a mile.

Sheet 204. By W. T. AVELINE, J. R. DAKYNS, and J. C. WARD. Aberford, Barwick, Thorner. The beds shown are Alluvium, Magnesian Limestone and Marl, Coal Measures, and Millstone Grit, the last in 6 divisions. A few faults and coal-crops.

Sheet 262. By A. H. GREEN. Darton, Royston, West Bretton. The beds shown are Alluvium, Gravel, Boulder Clay, and M. Coal Measures (with 9 beds of sandstone and many coal-crops). There are many faults; and the underground positions of those affecting coal-seams are marked.

Sheet 288. By A. H. GREEN, J. C. WARD, and T. V. HOLMES. Ecclesfield, Oughtibridge, Wadsley. The beds shown are Alluvium, M. and L. Coal Measures (with many beds of sandstone and coal-seams), Millstone Grit and Yoredale Rocks, both with various divisions. W. W.

MISCELLANEOUS AND GENERAL.

Achiardi, A. D'. Bibliografia mineralogica, geologica, e paleontologica della Toscana. Boll. R. Com. geol. Ital. pp. 112-126, 171-190, 249-254, 398-402.

List of works on the mineralogy, geology, and palæontology of Tuscany up to, and partly including those published in, 1874.

Allman, Dr. G. J. Address to the Biological Section. Rep. Brit. Assoc. for 1873, Sections, pp. 94-104.

The theory of evolution is discussed on pp. 100-103. The bearing of geological facts upon this theory is stated, and reference is made to the structure and relation of Graptolites. W. T.

Anon. Handbook of Natural History; being an explanation of Boucard's Series of Pictorial Diagrams and Natural Specimens, illustrative of ...... Geology and Mineralogy. 8vo. London. Mineral Kingdom, pp. 215-234.

——. [H. B. Woodward.] The Geological Survey of the United Kingdom. Quart. Journ. Sci. no. xli. pp. 52-55.

Sketch of the origin and progress of the Survey, with an account of its present organization.

——. Journ. R. Hist. and Arch. Assoc. Ireland, ser. 4, vol. iii. no. 19, p. 152.

Notice of a wooden implement found at a depth of 10 feet in Killinure Bog, Enniskillen.

——. Notice of a fine Bronze hair-pin found in a Bog near Tullamore, King's Co., under a considerable depth of peat. Journ. R. Hist. and Arch. Assoc. Ireland, ser. 4, vol. iii. p. 154.

Argyll, Duke of. Anniversary Address to the Geological Society of London. Quart. Journ. Geol. Soc. vol. xxx. pp. lii-lxix.

——. Address on Geology. Coll. Guard. vol. xxviii. p. 901.

Report of the second Address delivered at Inverary.

Bayan, —. Observations sur la communication de M. Nagnès et les remarques de M. Vogt. Compt. Rend. 2 sess. Assoc. Franç. pp. 436-438.

Remarks of a general nature on the value of palæontological equivalence.

Belknap, Capt. Deep-Sea Soundings. Nature, vol. x. pp. 131, 356, 484.

Found a series of submarine ridges between the Sandwich Islands and the coast of Japan. The plains between were 12,000, 9600, and

7000 feet beneath the crests, which consisted of white coral and pieces of lava. Off the Kurile Islands the sea-bottom consisted of greyish black sand, gravel, and lumps of lava. Similar sand occurred at the Aleutian Isles. C. E. De R.

Bergstrand, C. E. Om sättet för upprättandet af s. k. agrikulturgeologiska kartor. [Method for regulating an agricultural geological map.] Geol. fören. Stockholm Förhandl. Bdt. i. pp. 294–299.

An outline of a scheme of divisions, colours, signs, &c. needful for such maps.

Bonney, Rev. T. G. Geology. Pp. viii, 128, 22 woodcuts. 12mo. London.

One of a series of 'Manuals of Elementary Science' (Society for Promoting Christian Knowledge). Treats of rock-structure, mineralogy and petrology, agents producing changes on the earth's surface (a third of the book), and palæontology, as well as of stratigraphical geology. W. W.

Boussingault, M. Du Concours des roches volcaniques à la formation et à la fertilité de la terre végétale. Ann. Chim. Phys. sér. 5, t. iii. pp. 390–417.

Bouvier, A. Prochain retour des déluges universels, &c. Lyons.

Brent, **John**. [On a Collection of incised Flints.] Journ. Anthrop. Inst. vol. iv. no. 1, pp. 88–90.

Remarks on a collection of worked flints, chiefly palæolithic, from Canterbury, and from the coast between Herne Bay and Reculver. It is maintained that the Canterbury implements are of ruder workmanship, and probably older than those from Reculver; and the author supports this view by contrasting the geological characters of the implement-bearing beds in the two localities. F. W. R.

Carpenter, W. B. Swiney Lectures on Geology. Coll. Guard. vol. xxviii. pp. 815, 829, 925. Short reports.

Carter, J. On a Skull of *Bos primigenius* perforated by a Stone Celt. Geol. Mag. dec. 2, vol. i. pp. 492–496 (woodcut).

The specimen was found in 1863 in peat at Burwell Fen, and was described at the time in the Antiquarian Communications to the Camb. Antiq. Soc. (vol. ii. no. xiii. p. 285). Reasons are now given why the celt must have been fixed in the skull at the time it was covered up by peat. W. T.

Castro, Fernandez de. Notas para un estudio bibliográfico sobre los origenes y estado actual del mapa geológico de España. Bol. Com. map. geol. Españ. vol. i.

In this introduction to the Journal of the Commissioners of the geological Map of Spain, by its President, reference is made to every document bearing on the geology of that country, from the works of the oldest writers to the latest paper published, including the scarcely known writings of the Moorish authors of Spain. J. McP.

CHAMBERS'S ENCYCLOPÆDIA. Revised ed. 10 vols. 8vo. London and Edinburgh.

The articles are not signed; but a list of contributors is given. The chief names connected with geology are W. Carruthers, Dr. R. Chambers, Prof. J. Nicol, and W. Pengelly. W. T.

CHANCOURTOIS, A. E. B. DE. Présentation d'une boussole construite par M. Dutrou. [Exhibition of a new Compass.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 346–349.

Description of the compass and clinometer (éclimètre) used by the officers in charge of the Geological Survey of France.

——. Mémoire sur la classification chronologique des formations. [Chronological classification of formations.] Compt. Rend. t. lxxix. pp. 89–93, Abstract.

Divides the geological scheme into the *Preliminary*, the *Primary*, the *Secondary*, the *Tertiary*, and the *Recent* great groups of formations. The subdivisions are based on a theory of recurrence, in each of the great groups, of analogous palæontological and lithological conditions. G. A. L.

——. Système et mode d'application de la légende géologique générale de la carte détaillée de la France. [Description of the system employed in fixing the signs in the Geological Map of France.] 56 pp. tables. Ann. des Mines, 7 ser. vol. v.

A guide to the signs and modes of reference in the large geological map of France, now in course of completion by the Government.

CHARPENTIER DE COSSIGNY, —. La Terre, sa formation et sa constitution actuelle. Notice à la portée des gens du monde. Pp. 93. 8vo. Paris.

CONTEJEAN, CH. Éléments de Géologie et de Paléontologie. Pp. 747; 467 figures. 8vo. Paris.

Divided into four parts. The first is cosmical; the second contains a physical description of the earth; the third describes the present action of geological agents; the fourth deals with petrology, stratigraphical geology, and palæontology. The author uses the term *pyrosphere* for the molten matter beneath the solid crust of the earth. F. W. R.

DANA, Prof. J. D. Manual of Geology. New ed. 8vo.

Differs from the last edition in being a sixth larger, though not apparently so in the paging. The changes in nomenclature have been noticed at p. 114 (the Primordial or Cambrian, Canadian, and Trenton Periods making up the L. Silurian). Under "Carboniferous" the relation of the *Cardiocarpi* and *Cordaites* to fruits and leaves of *Welwitschia* is brought out (pp. 328, 330), and there is a discussion on the alumina in coal and in Lycopods (pp. 365, 366). The reference of the warm climate of the Miocene to a subsidence of the region of

Behring's Strait, letting in the warm Japan current of the Pacific, and that of the cold climate of the Glacial era to a rising of Arctic lands, thereby excluding the Gulf Stream, are new (pp. 755, 756). Two new chapters occur at pp. 687–696, 758–764. There are large additions throughout, and many new cuts.

W. W. (from a letter from Prof. Dana).

DARWIN, CHARLES. The Structure and Distribution of Coral Reefs. Ed. 2. Pp. xx, 278, 3 maps, 6 woodcuts. 8vo. London.

Contains replies to criticisms of Prof. Dana and Dr. Semper. An account of the Pelew Islands is added, as also a description of a bar of sandstone off Pernambuco. The later chapters have been almost re-written, and the maps have been revised. F. W. R.

DAVIS, WILLIAM S. First Book of Geology. 160 pp., 115 illustrations. 12mo. New York.

Reprint from English edition.

DAWKINS, Prof. W. B. Inaugural Address, 1874. Trans. Manchester Geol. Soc. vol. xiii. part vii.

Refers to evidence before the Coal Commission that blood-heat would be reached in long-wall collieries at 3420 feet; but 1040 metres (3511 feet) had been reached without need of any special ventilation. After noticing various memoirs, states .that the classification of the Drifts proposed by Mr. J. Geikie will not apply to Lancashire, and that probably the musk sheep and Arctic mammals lived in Southern France during the period of minimum temperaturé marked by the ice-sheet in Northern Britain, and that they retreated southwards before the increasing cold. C. E. DE R.

——. Note on the occurrence of palæolithic implements, associated with bones of extinct mammalia, in old river-gravels of Europe and India. Mem. Lit. Phil. Soc. Manchester, xiv. p. 15.

DEBRAY, H. Poteries anciennes et mammifères dans la tourbe de Nortkerque. [Ancient pottery and mammals in the peat of Nortkerque.] Ann. Soc. Géol. Nord, 1870–1874, p. 9.

Note of occurrence.

——. Silex polis dans la tourbe de Quérieux. [Polished flints in the peat of Quérieux.] Ann. Soc. Géol. Nord, 1870–1874, p. 9.

Note of occurrence.

——. Antiquités des tourbières d'Ardres et d'Aveluy. [Antiquities of the peat-deposits of Ardres and Aveluy.] Ann. Soc. Géol. Nord, 1870–1874, pp. 29, 30.

Flint implements at the former place; polished flint axe, worked antlers, and Roman medals at the latter.

——. [Stone hatchets from the neighbourhood of Lille.] Ann. Soc. Géol. Nord, 1870–1874, pp. 69, 70.

Note of occurrence.

Debray, H. Poteries anciennes trouvées aux Noires-Mottes. [Ancient pottery found at the Noires-Mottes.] Ann. Soc. Géol. Nord, p. 81.

Dechen, Dr. H. von. Bericht über die General-Versammlung der deutschen geologischen Gesellschaft am 13., 14., 15. Sep. 1873 zu Wiesbaden. Leopoldina, Heft 9, pp. 15–16, 24–32.

Report of the General Meeting of the German Geol. Soc. at Wiesbaden.

Delesse, M. La Litologia del Fondo de los Mares: Extractos por M. A. Piquet. Revista Minera, xxv. pp. 73–87, 104–117, 129–137, 145–159, 226–235.

A full analysis in Spanish of Delesse's well-known work.

Dollfus, Gustave. Principes de Géologie transformiste; application de la Théorie de l'Evolution à la Géologie. [Principles of transformist Geology; application of the Evolution Theory to Geology.] 180 pp. 12mo. Paris.

Erdmann, Edward. Populär Geologi (junte mineralogi) en framställning af jordytans sammansättning, bildning och fortfarande omgestaltning, med afseende särskildt fästadt vid svenska förhållanden. [Popular Geology, including mineralogy, with special reference to Sweden.] 189 pp., 65 woodcuts. 8vo. Stockholm.

The first part is an account of the commonest minerals, principally Swedish. The second part (pp. 27–189) is divided as follows:—Chap. I. Various kinds of rocks. Chap. II. On the forms and lie of rocks. Chap. III. Chief stratigraphical divisions. Chap. IV. Geological dynamics. Chap. V. (pp. 140–189). A brief account of the geology of Sweden, the chief formations in that country being Cambrian and Silurian (including the Dala sandstone, the Dal formations, the Seve and Köli groups, and the U. Silurian), Trias, Jurassic (the coal-bearing formation of Scania), Cretaceous, and Quaternary. This chapter contains information on the ore-deposits of Sweden, as well as descriptions of the various kinds of glacial and post-glacial accumulations.

G. A. L.

——. Geologiska Väggtaflor. [Geological diagrams.] 2·35 × 2 Swedish feet. 6 coloured plates. Stockholm.

Diagrams for public instruction. The plates illustrate the following subjects:—1. Development of the globe; the various formations; volcanoes. 2. Water- and ice-action in altering the surface of the earth. 3. Positions and relative arrangement of the rocks. 4. Quaternary beds, showing varied arrangement of glacial beds in Sweden. 5. Coal and metal mines. 6. Chief fossils of different periods. G. A. L.

Fisher, Rev. O. On the Antiquity of the Worked Flint from the Brickearth of Crayford. Geol. Mag. dec. 2, vol. i. p. 479.

Letter giving reasons for believing that the flint flake referred to really occurred in place.

Flahaut, —. Silex taillés au Mont Noir. [Worked flints at the Mont Noir.] Ann. Soc. Géol. Nord, 1870–1874, p. 66.

Note of occurrence, with notice of pebbles from the Fontinettes marked with unexplained striations.

Fogh, C. Geologicus Hovetsœtninger, fremstillede med sœrligt hensyn til de hjemlige Forhold. [Elements of Geology with special reference to Denmark.] Copenhagen.

Garrigou, F. Action de l'acide sulfhydrique des sources de Luchon sur le granite des galeries de captage. [Action of hydrosulphuric acid on granite.] Compt. Rend. t. lxxix. pp. 541, 542.

Gaudry, Albert. Notice sur les travaux scientifiques de d'Archiac. [The scientific work of d'Archiac.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 230–245.

A bibliographical account of d'Archiac's geological writings, with an analysis of the principal, and a list of his papers.

Girard, Jules. Les explorations sous-marines. Hydrographie, appareils de sondages, le sol sous-marin, la vie dans les profondeurs de la mer, les eaux, les mers anciennes. [Submarine explorations. Hydrography, sounding apparatus, sea-bottom, deep-sea life, the waters, the ancient seas.] Pp. 256, 115 figs. in text. 8vo. Paris.

Contains a popular account of marine geology.

Grad, Ch. Considérations sur les progrès et l'état des sciences naturelles. Lectures faites à Colmar. $1^{\text{ère}}$ partie:—Geologie et Paléontologie. [On the progress of Geology and Palæontology.] 8vo. Paris. Also in Bull. Soc. Hist. Nat. Colmar, p. 315.

Griffith, Dr. J. W. (and others). The Micrographic Dictionary, Ed. 3, Parts xiii.–xxi. (end). 8vo. Lond. [Though the title-page bears date 1875, these parts were published in 1874.]

Contains articles on geological matters. Plate 19 is of "Fossils."

Guerne, Jules de. Haches en silex des environs de Douai. [Flint hatchets from the neighbourhood of Douai.] Ann. Soc. Géol. Nord, 1870–1874, pp. 68, 69.

Note to accompany a collection.

Hauer, Dr. F. R. v. Jahresbericht. [Anniversary Address.] Verh. k.-k. geol. Reichs. pp. 1–14.

Mainly a review of the progress of geological science in Austria during 1873.

——. Die Geologie und ihre Anwendung auf die Kenntniss der Bodenbeschaffenheit der Österr.-Ungar. Monarchie. Vienna. Pp. viii, 681; 658 woodcuts.

A treatise on Geology, with special reference to the Austro-Hungarian Monarchy. Divided into two parts, General Geology and Descriptive Geology. The first part contains chapters on the Crust of the Earth, its Chemical and Mineralogical Constituents, Rocks, Formation of the

Earth, Dynamical Geology, and Historical Geology. The second part describes the successive formations, illustrating them with sections, fossils, &c. from Austro-Hungarian sources. F. W. R.

Heinrich, O. J. On Working Thick Coal Seams. Iron, vol. iii. pp. 167, 203.

Hill, Rev. J. S., and **Fairley**, W. On the occurrence of Fossil Coal generally in different Rock formations: its origin and varied composition. Coll. Guard. vol. xxviii. pp. 14, 50, 85, 121, 157, 202.

A compilation translated and edited from the German. Gives a *résumé* of the geological distribution of coals and lignites, with many references to foreign authors. The mechanical and chemical alterations to which coal-seams are subject are dwelt on and illustrated. G. A. L.

—— ——. On the circumstances of deposit of coal of the Carboniferous era, and other mineral coal, and on the species of rock and minerals found in association with them. Coll. Guard. vol. xxviii. pp. 229, 230, 265, 337, 361, 373.

The heads of this compilation, translated and edited from the German, are:—1. On the circumstances of deposit of coal of the Carboniferous era, and their different zones. 2. The species of rock prevailing in the Coal Measures, and the heterogeneous minerals occurring therein. G. A. L.

Hochstetter, F. von. Die Fortschritte der Geologie. [Progress of Geology.] Pp. 32. Vienna.

Lecture to the Vienna Academy. Reviews the development of geology, and its relation to other sciences.

Hughes, Prof. T. M'K., and Rev. D. R. **Thomas**. On the occurrence of Felsite Implements of the Le Moustier type in Pontnewydd Cave, near Cefn, St. Asaph. Journ. Anthrop. Inst. vol. iii. no. 3, pp. 387–392, with plate (section).

Fragments of felstone rudely worked into forms resembling those of the Le Moustier flints were found among the débris thrown out from Pontnewydd Cave. Associated with these implements were bones and teeth of various animals, and a molar tooth of man, apparently as ancient as the other remains. F. W. R.

Jentzsch, —. Die geologische und mineralogische Literatur des Königreichs Sachsen und der angrenzenden Ländertheile, von 1835 bis 1873, systematisch zusammengestellt. [Geological and mineralogical Literature of the Kingdom of Saxony and the neighbouring countries, from 1835 to 1873, systematically arranged.] Pp. 132. Leipzig.

Johnson, Dr. A. E. Geological and Archæological Evidences of the Antiquity of Man. Bull. Minnesota Ac. Nat. Sci. pp. 101–141.

Presidential address. Treats the subject under these headings:—Danish Peat-beds, Somme Valley Peat-beds, Lake Dwellers, &c., Epoch of Extinct Animals, Extinct Animals in Glacial Drift, Was Man Contemporaneous with the Extinct Animals? Cave Dwellers, Man in the Glacial Epoch, How Long since the Commencement of the Glacial Epoch? Notices the finding of a human skull at a depth of 130 feet in auriferous gravel in California. W. W.

Langtry, George. On a Bronze Cauldron, and on a Carved Timber Dish, found in Bogs in the County Antrim, Ireland. Journ. Roy. Hist. & Arch. Assoc. Ireland, ser. 4, vol. iii. no. 17, pp. 20–23 (2 woodcuts).

The cauldron was found at Cape Castle, in a solid bank of turf 9 feet below the surface. This does not represent the amount of peat originally superimposed; for the bog has been used for fuel. The wooden dish was got in Ballykenver Bog, near Armoy, in solid peat 5 feet below the surface; but in this case also the bog has been used. E. T. H.

Lartet, L., and Chaplain-Duparc. Sur une Sépulture des anciens Troglodytes des Pyrénées, superposée à un foyer contenant des débris humains associés à des dents sculptées de Lion et d'Ours. [Burying-ground of the ancient Troglodytes of the Pyrenees, &c.] Compt. Rend. t. lxxviii. pp. 1234-1236.

The human remains were found associated not only with bones of the mammoth, lion, and reindeer, both sculptured and untouched, but also with implements which suggest to the authors that we have evidence (for the first time in these regions) of the passage from the age of flaked to that of polished stone. The human bones have all the characters shown by the Cro-Magnon man. G. A. L.

Leeds, Prof. Notice of a sudden elevation of temperature in a lead mine in Missouri from 60° to over 100°, caused by oxidation of sulphide of iron. Proc. Ac. Nat. Sci. Philadel. p. 145.

Lejeune, —. Fouilles à Noires-Mottes, Cap Blanc-Nez. [Excavations at Noires-Mottes, Cape Blanc-Nez.] Ann. Soc. Géol. Nord, 1870–1874, pp. 17, 28.

Objects referred to the Reindeer age, the age of polished stone, and the Roman period have been found.

——. Haches en silex trouvés dans la grotte de *La Grande Chambre*. [Flint hatchets in *La Grande Chambre* cave.] Ann. Soc. Géol. Nord, 1874, pp. 61, 62.

The implements were found with remains of Elephant, Rhinoceros, Hyæna, &c. The cave is in the Pas-de-Calais, near Hydrequent.

Lyell, Sir Charles. The Student's Elements of Geology. Ed. 2. Pp. xx, 672. 8vo. London. 645 woodcuts.

The chief addition consists of a Table of British Fossils (by R. Etheridge), showing the first appearance and development of the chief orders, classes, and families of animals and plants from the Cambrian to the Recent Period. This takes up 21 pages. W. W.

Lyman, B. S. On the Importance of Surveying in Geology. Trans. Amer. Inst. Min. Eng. vol. i. pp. 183–192.

An explanation of the use and methods of geological surveying, with a sketch of the early history of the Pennsylvania State Survey.

Malet, H. P. Sign-posts on Ocean's Highway. Geogr. Mag. vol. i. pp. 95, 188, 232, 324, 371.

Bone-Caves (pp. 95–102).—Believes that the remains found in bone-caves are possibly contemporaneous with the formation of the limestone itself. *Basalt* (pp. 188–194, 232–236).—Concludes that basalt is a water-deposited rock. *Dust* (pp. 324–328). *The Birth of Dust* (pp. 371–375). G. A. L.

Marsh, G. P. The Earth as modified by Human Action. A new ed. of 'Man and Nature.' Pp. xxi, 656. 8vo. Lond. and New York.

The general arrangements of the two editions is the same; but in the later there are many additions, especially in the footnotes. Chap. I. (pp. 1–55) is *Introductory*: it treats of changes of climate within historic times, formation of bogs, &c. Chap. II. (pp. 56–147) treats of changes in animal and vegetable life. Chap. III. (pp. 148–397). *The Woods*; describes the changes resulting from the felling or planting of forests, as influencing rainfall, springs, landslips, &c. Chap. IV. (pp. 398–544). *The Waters*; embanking, drainage, irrigation. Chap. V. (pp. 545–608). *The Sands*; coast- and inland dunes. Chap. VI. (pp. 609–644). *Projects* of physical change accomplished or proposed by man; cutting of isthmuses, changes in inland seas, transportal of soil, &c. W. T.

Medlicott, H. B. Annual Report of the Geological Survey of India for 1873. Rec. Geol. Surv. Ind. vol. vii. pt. 1, pp. 1–12.

Gives an account of the distribution and progress of work on the Survey, and a notice of the publications issued by it; illustrated by an index-map. F. D.

Meunier, Stan. Cours de géologie comparée, professé au muséum d'Histoire Naturelle. [Course of Comparative Geology.] 8vo. Paris.

Moffat, Dr. T. On a Horn and Bones found in a Cutting in a Street in Maidenhead, Berks. Rep. Brit. Assoc. for 1873, Sections, p. 84.

The horn and bones, which were much mineralized, were found in flint-gravel, about 6 feet from the surface. There are cuts upon the horn, which appear to have been made with an edged metallic tool.
W. T.

——. On Geological Systems and Endemic Diseases. Rep. Brit. Assoc. for 1873, Sections, pp. 84, 85.

Observations made in Cheshire and the surrounding district tend to confirm the opinion that goître and anæmia are endemic on the Carboniferous beds, while they are absent on New Red Sandstone. These diseases are liable to prevail when there is a deficiency of iron and phosphates in the blood; these constituents are sparingly present in Carboniferous beds, but are more abundant in the New Red. Refers to a Millstone Grit district, where the soil is much coloured by oxide of iron, and goître and anæmia are unknown. W. T.

Morton, G. H. The Carboniferous Limestone and Millstone Grit of North Wales. Part I. Proc. Liverpool Geol. Soc. session 15, pp. 16–19.

Consists of a list of 30 works relating to the subject, published between 1778 and 1873.

Noelas, —. Note sur les Mardelles et les silex taillés des Mâchefers de la plaine de Combret près Roanne. [*Mardelles* (ponds) and worked flints of the *Mâchefer* (iron-conglomerate) of Combret, near Roanne.] Bull. Soc. Géol. France, 3 sér. t. i. pp. 481.

Note on remains of lacustrine dwellings in ponds, known in the neighbourhood as *servas* or *redoutes*; also of worked flints in a curious deposit of ferruginous conglomerate, called locally *mâchefer*, which is found close to the surface, and is now in course of formation. G. A. L.

Omboni, G. Su degli oggetti preistorici provenienti da una delle caverne di velo nel Veronese. Venice.

Ortlieb, J. Silex taillés au Mont des Chats. [Worked Flints at Mont des Chats.] Ann. Soc. Géol. Nord, 1870–1874, p. 4.

Note of occurrence.

Partridge, W. Rapport sur le Catalogue des Fossiles Tertiaires qui se trouvent au Musée Fédéral de Zurich. [Tertiary fossils, Zurich Museum.] Bull. Soc. Géol. Norm. t. i. 2 fasc. pp. 217–224.

A review of M. Mayer's views on the arrangement of fossil collections, which the writer thinks suited only to large, and useless for local general collections. Explains a plan for the latter based on:—1, the division of a collection into as many parts as there are geological horizons in the locality it represents; 2, the classification of the rocks with their fossils in the order of superposition; 3, series of fossils of each horizon classified zoologically. G. A. L.

Pengelly, W. The Flint and Chert Implements found in Kent's Cavern, Torquay, Devonshire. Rep. Brit. Assoc. for 1873, pp. 209–214; and Quart. Journ. Sci. no. xlii. pp. 141–155.

Gives an account of the succession of deposits in Kent's Cavern, and of the remains which they contain (see p. 29). The implements found in the oldest deposit, the breccia, are rudely formed, massive, and unsymmetrical; they have been formed direct from flint nodules, and generally retain traces of the original surface. The implements from the cave-earth are ovoid, lanceolate, and tongue-shaped; they are symmetrical, and have been formed from flakes previously struck off the flint nodules. Bone needles, harpoons, and a perforated badger's tooth have been found in the cave-earth, but nothing of the kind in the breccia. That the implements of the breccia are of earlier date than those of the cave-earth is certain; that they belong to a ruder age may be inferred. Great as may be the antiquity of the cave-earth men, that of the breccia men must be at least double. W. T.

Périer, —. Les formations contemporaines du fond des océans. [Sea-bottoms.] Bull. Soc. Géogr. Paris, pp. 91–93.

Phillips, Prof. J. Address to the Geological Section of the British Association. Rep. Brit. Assoc. for 1873, Sections, pp. 70–75.

Sketches the advance of geology since the first meeting of the Association at York in 1831. Allusion is made to the development of the coal- and iron-fields, the sub-Wealden boring, recent researches regarding the oldest and the newest British formations, terrestrial physics, the glacial period, and the theory of evolution. W. T.

Pozzi, B. La Terre et le Récit Biblique de la Création. Pp. xi, 578. 8vo. Paris.

Divided into three books. The first gives a popular exposition of physical geography and geology; the second is devoted to the biblical narrative; and the third discusses the relation between the scientific and the theological views. F. W. R.

Puydt, P. E. de. Sur l'homme préhistorique. Mém. Soc. Sci. Hainaut, sér. 3, t. ix. pp. 7–26.

Presidential address on the antiquity of man, with special reference to discoveries in Belgium.

Ramsay, Prof. A. C. On the Comparative value of certain geological ages (or groups of formations) considered as items of Geological Time. Proc. Roy. Soc. vol. xxiii. p. 334.

The Cambrian and Silurian may be divided into three groups, separated by unconformities, and each characterized by a fauna of its own. The Devonian may also be divided into three groups, each characterized by a fauna of its own. On these grounds the author thinks that the time occupied in the deposition of the Devonian rocks may have been as long as that occupied in the deposition of the Cambrian and Silurian together. Again, the Jurassic, Neocomian, and Cretaceous formations form a similar threefold group, which may be comparable either with the Silurian or Devonian trilogy. The Carboniferous is then correlated with the Eocene, the Permian with the Miocene, and the Trias with the Pliocene, on the strength of sundry resemblances in the conditions under which they were formed; and thus the conclusion is arrived at that the great local continental era, extending from the beginning of the Old Red Sandstone to the end of the Triassic period, is comparable in point of time to all the time that has elapsed from the beginning of the Lias down to the present day. Considerations follow tending to the same conclusion from a palæontological point of view. A. H. G.

Ritchie, A. T. The Creation; or, Dynamical System of the Earth's Formation. In accordance with the Mosaic Record and the latest discoveries of science. New Ed. 8vo.

Rothwell, R. P. Abstract of Remarks on the Difficulties in the Identification of Coal Beds. Trans. Amer. Inst. Min. Eng. vol. i. pp. 62, 63.

Schœdler, F. Le Livre de la Nature. Éléments de Minéralogie, Géognosie, et Géologie. Traduit de la 18ᵉ édition allemande par H. **Welter**. Pp. 189, 2 plates. 8vo. Paris.

Scott, G. On the Geology of the Brighton Museum. 21st Ann. Rep. Brighton Nat. Hist. Soc. pp. 56–66.

A notice of the collection of fossils.

Scott, R. H., and W. **Galloway**. Colliery Explosions and the Weather. Nature, vol. x. pp. 157, 224.

Out of 70 fatal, and 224 non-fatal, explosions in 1872, 58 per cent. were due to changes of pressure, 17 per cent. to the great heat of the weather, and 25 per cent. to other than meteorological causes. The escape of fire-damp was found to be mainly dependent on the condition of atmospherical pressure. C. E. De R.

Sjögren, A. Formler för bestämmande af läget af en flöts. [Formula for determining the position of a bed.] Geol. fören. Stockholm Förhandl. Bdt. i. p. 202.

Let A, B, C be the positions of three bore-holes, and let $S =$ dip (reckoned from a horizontal plane), $V =$ angle which the strike of the bed makes with AB, $a =$ distance between A and B, $a' =$ distance between A and C, $w =$ angle of horizontal plane between AB and AC, $d =$ difference between the depths at which the bed is reached in A and B, $d' =$ difference between the depths at which the bed is reached in A and C. Then

$$S = \text{arc tan}\,\frac{d'}{a \sin V},$$

and

$$V = \text{arc tan}\,\frac{\frac{da'}{d'}\sin w}{a - \frac{da'}{d'}\cos w}.$$

G. A. L.

Stefanovič v. **Vilovo**, J. Die Entsumpfung der Niederungen der Theiss und des Banats. [The swamping of the low grounds of the Theiss and of the Banat.] Mittheil. k.-k. geogr. Gesell. Bd. xvii. pp. 193–227, 272–276.

Strange, Thomas L. The Development of Creation on the Earth. Pp. xii, 109. London.

An essay on the Processes of Creation, pp. 1–41; on the Antiquity of the Earth and its Human Inhabitants, pp. 42–89; Postscript, a review of Mr. Geikie's 'Great Ice Age,' pp. 90–109. F. W. R.

Stur, D. Reise-Skizzen. I. Dresden, d. 15. März, 1874. II. Zwickau in Sachsen; III. Halle a. d. Saale; IV. Berlin. V. Breslau. [Travelling sketches.] Verh. k.-k. geol. Reichs. pp. 135–138, 166–176, 293–305.

I. Notes on a visit to the Geological Museum of Dresden. II.–IV. Describe the chief features of interest observed in a visit paid to the Geological Museums of Zwickau, Halle, and Berlin. V. Describes the chief points of geological interest noticed in a visit to the Museum and neighbourhood of Breslau. H. A. N.

Tate, R. Rudimentary Treatise on Geology. [Partly based on Major-Gen. Portlock's 'Rudiments of Geology.'] Ed. 2. 8vo. Lond.

Taylor, J. E. Geological Stories. 8vo. Philadelphia.

An American reprint, with an Appendix of American formations.

Thomson, Prof. **Wyville**. Deep Sea Dredging on board the Challenger. Nature, vol. x. p. 142.

Describes the sea-bottom between Kerguelen and Heard Island as being composed of basaltic pebbles. South of the islands, amongst the ice, the soundings gave yellow clay, pebbles, and masses of diatoms. C. E. De R.

Viale-Prela. Sulla causa del Diluvio universale. 15 pp. 8vo. Rome.

Vogt, Carl. Sur la détermination de l'âge relatif des couches au moyen des Fossiles. [Determination of the relative ages of beds by means of fossils.] Compt. Rend. 2 sess. Assoc. Franç.

An *exposé* of the doctrine of Homotaxis.

Walenn, W. H. On Mineral Veins. Iron, vol. iv. p. 450.

Washburn, George. Calvert's supposed Relics of Man in the Miocene of the Dardanelles. Proc. Amer. Assoc. vol. xxii. B. pp. 203–205.

Describes the deposits in question, which lie midway between the Dardanelles and the Plains of Troy. The flints found have all the appearance of having been shaped by the action of water; and the supposed engravings on the bone are said to be probably the work of worms when the bone was in a soft state. The writer failed to find any evidence at the Dardanelles with reference to the antiquity of man. G. A. L.

Whitaker, W. List of Books, Papers, Maps, &c., on the Geology, Mineralogy, and Palæontology of Warwickshire. Rep. Rugby School Nat. Hist. Soc. for 1873, pp. 66–76.

A chronological list of 132 works, dating from 1685 to 1872, with an Index of Authors. One of a series of local bibliographies, those for Cambridgeshire, Devonshire, Hants. Basin, and Wiltshire having been previously published, besides other lists in Geological Survey Memoirs. W. W.

WHITLEY, N. The Palæolithic Age Examined. Journ. Vict. Inst. vol. viii. pp. 4–51.

After some introductory remarks the subject is treated under the following headings:—The Distribution and Origin of the Shattered Flints and Flint Flakes of Devon and Cornwall (pp. 6–10); Cores, Discs, and Scrapers (pp. 10–14); The "Implements" of the Drift (pp. 14–19); and the Drift "Implements"—their Surroundings (pp. 19–23). The discussion and remarks that follow (pp. 23–48) are chiefly by Mr. J. EVANS, Mr. WHITLEY, and Dr. CARPENTER. W. W.

WOODWARD, HENRY. On the Dawn and Development of Life on the Earth. [The substance of a Lecture.] Geol. Mag. dec. 2, vol. i. pp. 289–300.

Refers to the fauna of the later Tertiary deposits, and to the range and extent of the Nummulitic Limestone. The Chalk and its modern continuation are described, and the main biological features of the older rocks are passed in review. Animals have probably contributed more than any other agency towards building up the sedimentary rocks; this work has been done by the humblest classes, the Protozoa and Cœlenterata. From the earliest dawn of life till now there has been unbroken continuity of life. W. T.

Index to the Colours and Signs on the Maps and Sections of the Geological Survey of Ireland. A sheet. Dublin.

ADDENDA.

Abich, H. Geologische Beobachtungen auf Reisen im Kaukasus im Jahre 1873. Bull. Soc. Imp. Nat. Moscou, 1874, no. 2, pp. 278–342.

Anon. The Coalfields of Gloucestershire and Somersetshire. Iron, vol. iii. p. 68.

——. The Emerald Mines of Muzo. Iron, vol. iii. p. 327.

——. The Mineral Resources of Turkey. Iron, vol. iv. p. 99.

——. On Californian Coal. Iron, vol. iv. p. 613.

An account of a Paper on this subject read before the Californian Academy of Sciences by Dr. J. C. Cooper.

——. Iron and Coal in Tennessee. Iron, May 30.

Extracts from a letter by Gen. J. T. Wilder.

——. The Whitehaven Collieries. Iron and Steel Institute—The Excursions; Min. Journ. vol. xliv. p. 1141.

Section and mode of working in the Whitehaven and Cleator Moor coalfields.

——. The Iron Ore and Iron Trade of Northamptonshire. Min. Journ. April 11.

——. Mineral Wealth of Canada.—Cape Breton Coals. Min. Journ. July 25.

——. (A. R. O.) Northern Notes. Min. Journ. Aug. 8.

Notes on lodes of iron- and copper-pyrites in Norway.

——. Iron Prospects.—No. 3. Mining World, vol. vi. pp. 544, 545.

Gives analysis of 14 Belgian ironstones.

Areitio y Larrinaga, A. de, and F. Quiroga y Rodriguez. Excursion geológica en la Provincia de Segovia. An. Soc. Españ. Hist. Nat. vol. iii. part 3.

Describe the kaolin deposits of the Province of Segovia, and two caves near Pedraza de la Sierra, named "de la Griega," where bones of the Antelope and other animals, together with prehistoric pottery, have been discovered. J. M‘P.

Bachmann, Prof. J. Ueber Fündlinge im Jura. [Erratic blocks found in the Jura.] Mittheil. naturf. Gesell. Bern, p. 158.

Balfour, J. B. Letters received from the Naturalists attached to the Transit-of-Venus Expedition at Rodriguez. Proc. Roy. Soc. vol. xxiii. no. 157, pp. 135, 136.

Rodriguez consists of a succession of lava-flows (12 noticed), separated by beds of conglomerate or laterite. The basalt is dark, compact, and columnar, becoming in places porphyritic. A coralline limestone occurs in large sheets at the east and west of the island, and occasionally in patches, overlying the basalt. There are raised beaches on the south. Zeolites occur in the basalt. R. E., Jun.

Barcena, Mariano. Descubrimiento de una nueva Especie mineral in Mexico. [New Mineral, Mexico.] Naturaleza, t. iii. pp. 35–39.
Description of *Livingstonite* (see p. 223).

——. Viaje á la Caverna de Cacahuamilpa. Datos para la Geologia y la Flora de los Estados de Morelos y Guerrero. Naturaleza, t. iii. p. 75.

——. El Wad Oolitico. Naturaleza, t. iii. pp. 136–138.

Barkas, W. J. On the Microscopical Structure of Fossil Teeth from the Northumberland True Coal Measures. Monthly Review of Dental Surgery. 11 plates.

Barrois, Ch. Sur la craie de l'île de Wight. [Chalk of the Isle of Wight.] Ann. Soc. Géol. Nord, t. i. pp. 74–81; Bull. Soc. Geol. France, ser. 3, t. ii. pp. 428–433.
A résumé of a paper in the Ann. Sci. Géol. The zones described are as follows, in ascending order:—Gault, 30 metres thick; U. Greensand with *Ammonites inflatus*, 50 m.; Chloritic Marl with *A. laticlavius*, 2 m.; Craie glauconieuse with *Scaphites æqualis* (Grey Chalk), 35 m.; Craie marneuse with *Inoceramus labiatus*, 40 m.; Craie marneuse with *Terebratulina gracilis*, 20 m.; Craie blanche with *Holaster planus*, 20 m.; Craie blanche with *Micraster cor-testudinarium*, 50 m.; Craie blanche with *Micraster cor-anguinum*, 160 m.; Craie blanche with *Belemnites*, 80 m. The Chalk-rock lies in the zone of *Terebratulina gracilis*; the equivalent of the Totternhoe stone in that of *Inoceramus labiatus*. W. T.

Bauza, Felipe de. Breve reseña geológica de la Provincia de Gerona. [Brief geological sketch of the Province of Gerona.] Bol. Com. map. geol. Españ. vol. i.

Bayan, —. Sur la succession des assises et des faunes dans les terrains jurassiques supérieures. [Succession of the U. Jurassic series.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 316–343, pls. x. xi.
The conclusions are:—1, all the upper beds of the Jura may present an oolitic or madreporic *facies*; 2, all the oolitic beds yield in their faunas analogous forms; 3, all marly beds have similar relations; 4, notwithstanding these resemblances each bed has particular species which, either by their number, or even by their mere presence, indicate the various horizons. The following new species are described:—*Pachyerisma Tombecki* and *P. Royeri*, both from Corallian, Doulaincourt. G. A. L.

Berendt, —, and — **Meyn**. Bericht über eine Reise nach Niederland, im Interesse der königlich preussischen geologischen Landesanstalt. [Report of Geological Commission to Holland.] Zeitsch. deutsch. geol. Gesell. Bd. xxvi. Heft 2, pp. 284–317, with plate.

It has been determined to show the distribution of the superficial deposits of Prussia on the geological maps on a scale of 1 : 25,000; but before commencing this work a Commission was appointed to examine the way in which the surface-geology of Holland had been worked out under Dr. Staring, and to discuss the practicability of constructing the N. German map on similar principles. F. W. R.

Blake, Dr. C. C. Sulphur in Iceland. [A pamphlet.] 8vo. London.

Bonney, Rev. T. G. Notes on the Upper Engadine and the Italian Valleys of Monte Rosa, and their Relation to the Glacier-erosion Theory of Lake-basins. Quart. Journ. Geol. Soc. vol. xxx. pp. 479–489.

Though the author is ready to admit that glaciers may have excavated some lakelets and tarns, he maintains that none of the great Alpine lakes have been primarily formed, or have undergone any great secondary modification, by glacier-action. He prefers to account for these large and deep basins by irregular movements of upheaval and subsidence along lines athwart the valleys. A. H. G.

Boxberg, Fräulein von. Forsetzung der Ausgrabung der Höhle von Rochefort. [Exploration of Rochefort Cave.] Isis, 1874, pp. 146–149.

Bredemeyer, Dr. W. Geology of Upper Burmah, Khan, and West China. Min. Journ. May 2.

Condensed from the San Francisco Mining and Scientific Press.

Brown, Rev. T. On the Parallel Roads of Glen Roy. Proc. Roy. Soc. Edin. vol. viii. no. 89, pp. 339–342.

Records the discovery of *Diatomaceæ* in (*a*) finely stratified sand and clay, and (*b*) clay with boulders indistinctly stratified, forming a portion of the deposit known as the Parallel Roads of Glen Roy. The species obtained, four in number, are freshwater. R. E., Jun.

Brugnatelli, T., and P. **Pellogio**. Analisi dell' acqua minerale di Monte Alfeo; e Nota intorno all' azione del solfo sull' acqua e sui carbonati terrosi. Rend. R. Ist. Lomb. ser. 2, vol. vii. pp. 333–338.

Brunfaut, Jules. De l'exploitation des Soufres. [Working of Sulphur.] 8vo. Paris. Pp. 620.

Buckley, Dr. S. B. First Annual Report of the Geological and Agricultural Survey of Texas. Pp. 142. 8vo. Houston.

Burthe, P. L. Notice sur les gisements des minerais d'argent, leur exploitation et leur traitement métallurgique aux Etats-Unis. 2$^{\text{ème}}$ partie. Ann. Mines, sér. 7, t. vi. p. 8.

Calderon, Salvador. Reseña geológica de la Provincia de Guadalajara. Madrid.

After sketching the topography of the Province of Guadalajara, which is divided into three zones, the "Serrania" (Highland), the "Campiña" (Tableland), and the "Alcarria" (Lowland), describes the different geological formations, including, besides eruptive rocks and gneiss, the Silurian, Devonian, Carboniferous, Triassic, Jurassic, Cretaceous, Tertiary, and Recent deposits. A list of the fossils found in each formation is given; and reference is made, when describing the mineral wealth of the district, to the silver-mines of Hiendelaencina, the salt-mines of Tierzo, and the unimportant coalfield of Valdesotos, as also to the prehistoric stone implements and pottery found at Argecilla and other places. A small geological map accompanies this work. J. M'P.

——. Reseña geológica de la Provincia de Alava. Revista de la Sociedad de los profesorés de ciencias. Madrid.

A brief notice is given of the geography of the province of Alava. The granitic and eruptive rocks, and the Jurassic, Cretaceous, Tertiary, and Recent formations therein found are described. Reference is made to prehistoric remains found near Vitoria and in other parts of the province. J. M'P.

Castillo, A. del. Descripcion del Mineral bismutifero de San Luis Potosí. Naturaleza, t. iii. p. 92. [See p. 226.]

Chabas, F. Les Silex de Volgu. 4to. Châlons. 4 plates.

Christison, Sir R. Notice of Fossil Trees recently discovered in Craigleith Quarry, near Edinburgh. Trans. Roy. Soc. Edin. vol. xxvii. part 2, p. 203.

Clayton, Prof. J. E. The Mining Industry of Utah. Min. Journ. May 2, with 5 woodcut sections.

An account of the district, compiled from papers written by Prof. Clayton [? in Utah Mining Gazette]. See also a letter signed "Fair Play" in Min. Journ. April 4. W. T.

Cockburn-Hood, T. H. Remarks upon the Footprints of the Dinornis in the Sand Rock at Poverty Bay, New Zealand, and upon its recent extinction. Proc. Roy. Soc. Edin. vol. viii. no. 87, pp. 236–240.

Cook, George H. Geological Survey of New Jersey. Annual Report of the State Geologist for the year 1874. Pp. 116. 8vo. Trenton.

This work, though dated 1874, may really have been issued in 1875. It describes the iron-mines in the northern part of the State, notices other ores, and describes various clays, giving analyses. W. W.

Cortazar, Daniel. Datos geologico-mineros de las Provincias de Zamora y Orense. Bol. Com. map. geol. Españ. vol. i.

The first part refers to the province of Zamora, and the second to that of Orense. Both are geographically and geologically described, and a notice is given of their mineral wealth. J. M'P.

Dodsworth, C. Lead Mining in Limestone [N. of England.]. Min. Journ. April 18.

Donayre, F. M. Datos geológico-mineros recojidos en la Provincia de Guadalajara y en el término de Valdesótos. Bol. Com. map. geol. Españ. vol. i.

In these notes on the geology and mineralogy of the Province of Guadalajara the author describes a coalfield near Valdesotos, which he considers cannot be profitably worked. J. M'P.

——. Bosquejo de una descripcion fisico-geológica de la Provincia de Zaragoza. Mem. Com. map. geol. Españ.

The first part describes the geography, meteorology, and agriculture of the province of Zaragoza, and gives a list of the heights and geological horizons of about 250 localities. The second part is a geological description of that district, where, besides eruptive rocks, the Silurian, Devonian, Triassic, Jurassic, Cretaceous, Tertiary, and Recent formations appear. The different fossils of each formation are mentioned; and a descriptive list of about 350 rocks is annexed, together with a note on the mineral wealth of the country. A coloured geological map to the scale of $\frac{1}{400000}$, 5 sections, 3 landscapes, and a plate representing several species of *Cruziana* from the Silurian deposits accompany the work. J. M'P.

Dornès, —. [The St. Louis Canal and the Mouths of the Rhone.] Mém. Soc. Ing. Civ. no. 4, pp. 740–746.

Gives an account of alluvial changes near the mouth of the Rhone, observed during and since the construction of the canal. (Abstract in Proc. Inst. Civ. Eng. vol. xli. pp. 251–253.) W. T.

Dunn, E. J. On the Mode of Occurrence of Diamonds in South Africa. Quart. Journ. Geol. Soc. vol. xxx. pp. 54–60, 2 woodcuts.

Diamonds occur in circular "pipes" or "pans," which are regarded as old volcanic vents. They have been worked to a depth of 130 feet; the upper part contains surface-products; then comes soft decomposed euphotide or gabbro (?), which gets harder and less altered below. The altered rock contains garnet, calc-spar, mica, bronzite, augite, diopside, diallage, iron-pyrites, &c.; and in this the diamonds occur, often in fragments. The gems differ in character in the various diggings. The shale at the sides of the pipes is always turned upwards. The other intrusive rocks of the district are noticed. Diamonds also occur in Drift deposits of two ages: the older Drifts are at a higher level along the Vaal than the newer, and they also occur as outliers. W. T

Ehrenberg, —. De la Tòba fitolitaria de Valle de Toluca (Translation). Naturaleza, t. iii. pp. 118–132.

Endlich, Dr. F. M. Mineralogical Collection, and List of Minerals in the National Museum, 1873. Ann. Rep. Smithson. Inst. for 1873, pp. 51–53, 70, 71.

Feistmantel, Dr. Ottokar. Studien im Gebiete des Kohlengebirges von Böhmen. Pp. 175, 3 plates (fossil plants), woodcuts (sections). 4to. Prague. Pub. in Abh. k. böh. Gesell. Wiss. for 1874.

Describes the coal-bearing rocks of Bohemia; traces their distribution, reviews their flora, and notices each deposit in detail. Some of the upper beds of coal are in Permian rocks. F. W. R.

——. Ueber ein neues Vorkommen von nordischen silurischen Diluvialgeschieben bei Lampersdorf in der Grafschaft Glatz. Prague.

Figueeva, J. M. M. S. de. Descripcion del Volcan de Tuxtla. Naturaleza, t. iii. pp. 106–114.

Gascue, Francisco, and Ramon Ynguenza. Algunas modificaciones que segun los estudios geológicos del Señor Don José Caminero en la Provincia de Ciudad Real, deben introducirse en los datos publicados sobre dicha comarca. Bol. Com. Map. geol. Españ. vol. i.

The authors, referring to a paper and to a collection of rocks and fossils forwarded to the Commissioners of the geological map of Spain by Don José Caminero, rectify several errors published respecting the geology of the Province of Ciudad Real. A descriptive list of the rocks sent by M. Caminero is annexed. J. M‘P.

Gastaldi, B. Sulla Cossaite varietà sodica di Onkosina. At. R. Ac. Sci. Turin, vol. x. pp. 189–200.

Geikie, A. The Sub-Wealden Exploration. Nature, vol. x. pp. 220, 221.

Gilpin, J. B. Observations on some Fossil Bones found in New Brunswick, Canada. Trans. Nov.Scot. Inst. vol. iii. part 4, p. 400.

Graff, —. Notice sur les terrains paléozoïques du département de l'Hérault. [Palæozoic rocks of Hérault.] Lyons.

Grand, —. [The Coal Basin of the Asturias.] Mém. Soc. Ing. Civ. pp. 304-312.

The coal is of Carboniferous Limestone age, and is associated with limestone, schists, sandstones, and conglomerates. The dip of the beds is generally 60° to 70°, and their total thickness may be from 6000 to 10,000 feet. The seams average 2·3 feet in thickness; they rarely exceed 7; but some reach 10. The alluvial beds overlying the coal are impregnated with mercury; hæmatite and antimony also occur. (From abstract in Proc. Inst. Civ. Eng. xl. 349.) W. T.

Greenwood, W. H. A Manual of Metallurgy.—Vol. I. Fuel, Iron, Steel, Tin, Antimony, Arsenic, Bismuth, and Platinum. Pp. 260. 8vo. London and Glasgow.

Contains notices of ores, with analyses.

Harting, P. De bodem van het Eemdal. [Geology of the Eem Valley.] Ver. Med. kon. Ak. Wet. Reeks 2, Deel 8, Stuk 3, pp. 282–290.

Recent borings in the valley of the Eem show the existence of similar deposits to those at Amsterdam; and as these are more recent than any of Dumont's Pliocene beds, they are separated under the distinctive name of the *Eem system* (Eem-stelsel). They are characterized by the occurrence of *Cerithium lima* and *Venus rotundata*. F. W. R.

Heale, Josh. Tin in Portugal. Min. Journ. March 28.
Notes on lodes in the province of Tras os Montes.

Helland, Amund. Om Kromjernstein i Serpentin (Chrome iron-ore). Forhand. Vid. Selskb. (for 1873), page 151.
The occurrence of chromite-bearing serpentines in the region between Köraas and Molde is described, and their origin attributed to the decomposition and recomposition of diallage or of diallage-bearing rocks. They occur among different stratified formations, both as dykes and intercalated bands, and contain the chromite (which is peculiar to them) in patches, often grouped along planes coinciding with neighbouring stratification. The frequent pseudomorphic association of serpentine with diallage, the fact that the latter often contains traces of chrome-oxide, and certain chemical relations shown, support the view taken. H. M.

Helmhacker, R. Der Antimon-Bergbau Milešov bei Krásná hora in Böhmen. Jahrb. k.-k. Bergakad. Bd. xxii. p. 340.

Hering, C. A. Die Hohenelber Kupfererzlagerstätten. [The copper-ore deposits of the Upper Elbe].

Hitchcock, Prof. C. H. The Coal-measures of the United States. Iron, vol. iv. p. 426.
A summary of the superficial extent and vertical thickness of the Carboniferous Coal-measures of the United States.

—— and J. H. Huntingdon. The Geology of New Hampshire. A Report comprising the results of Explorations ordered by the Legislature.—Part I. Physical Geography. Pp. 688. 8vo. Concord.
Gives a history of the Geological Surveys of the State, and other geological information. (From notice in Amer. Journ. ser. 3, vol. ix. p. 222.)

Honeyman, Dr. D. Geology of Nova Scotia. Trans. Nov. Scot. Inst. vol. iii. part 4, p. 345.

Hume, W. C. Report on the Queensland Tin Fields. Pp. 31. 8vo. With geological information and particulars of rocks, &c.

Hunt, John. Mount Bischoff Tin Mines, Tasmania. Min. Journ. Feb. 21.
No true tin-lode has been found. There is an antimony-lode in slate, near the granite.

Hunt, R. Mineral Statistics of the United Kingdom of Great Britain and Ireland for the year 1873. With an Appendix. 8vo. Lond. Pp. xviii, 278.

Jervis, G. I Tesori Sotterranei dell' Italia. [Title on p. 74.]

The continuation of a work the first volume of which (on the Region of the Alps) was published previously, whilst the third (Sardinia and Sicily) is yet to come. This part refers to the Region of the Apennines, and to the active and extinct volcanoes connected therewith.

Considerations on the physical and chemical changes of rocks and minerals through chemical decomposition, pp. 3–7; list of the minerals of the sedimentary rocks of the Apennines, pp. 9-13; detailed notice of minerals, mineral waters, aërolites, mines, &c., in each province, pp. 33–624; the stratified nature of serpentine explained at p. 143; sulphur a stratified and not a volcanic product, p. 189; boracic-acid lagoons not due to volcanic agency, but to decomposition of stratified rocks, p. 430; Vesuvius, pp. 587–607, chronology of its eruptions, its minerals, and its gases. W. W.

——. Cenni geologici sulle montagne poste in prossimità al giacimento di Antracite di Demonte. [Geological notes on the mountains adjacent to the Anthracite deposit of Demonte.] 8vo. Pp. 16. Translated, with additions, in Min. Journ. Aug. 7, 1875.

The argillaceous and calcareous schists of Demonte are identified with the Gailthal beds, now for the first time discovered in the Western Alps, and belong truly to the Carboniferous formation; thickness about 1600 feet. Below are Serpentine and Euphotide rocks surmounted by talcose schists. The first coal is found 33 feet above the top of the talcose schists; five beds are mentioned; the distance between them varies from 23 to 115 feet; but their thickness is not given; quality anthracitic. Coal could be won to a depth of 275 fathoms by levels, without any shaft. Above the Carboniferous shales are beds of white quartz, and then Palæozoic limestones, 3300 feet thick. E. B. T.

Kendall, J. D. The Hæmatite deposits of Whitehaven and Furness. Coll. Guard. vol. xxviii. pp. 157, 230, 374, plan and 18 figs. in text.

Describes the deposits in detail. The Whitehaven hæmatite is harder and more compact than that of Furness. Gives sections of the ore-bearing beds in each district, and analyses of the various qualities of ore. Examines the theories which have been imagined to account for the formation of the deposits, and dismisses that of the igneous origin, believing that the hæmatite was originally deposited as carbonate, partly displacing the limestone, and partly in previously existing caverns. Thinks that the hæmatite is younger than the Carboniferous Limestone, and older than a great part of the Permian.

G. A. L.

Killebrew, J. B., Dr. J. M. Safford and others. Introduction to the Resources of Tennessee. First and Second Reports of the State Bureau of Agriculture. Pp. 1193, 5 maps. 12mo. Nashville.

Gives a geological map, a description of the formations, and a chapter on Farm-Geology.

Landerer, José J. El piso Tenéncico ó Urgo-Aptico y su fauna. An. Soc. Españ. Hist. Nat. vol. iii. part 3.

Describes the Urgonian and Aptian deposits, especially those of Eastern Spain in the Provinces of Castellon, Tarragona, and Teruel; and proposes to name them Urgo-Aptian or Tenentian, the region of ancient Tenentia in the Province of Castellon proving their intimate connexion, and affording a great number of characteristic fossils. A catalogue of 201 genera and 968 species of fossils accompanies the paper. J. M'P.

Lill, M. V. Analysen und anderweitige Untersuchungen. Jahrb. k.-k. Bergakad. Bd. xxii. p. 381.

Loriol, P. de. Description de quelques Astérides du Terrain Néocomien des environs de Neuchâtel. Mém. Soc. Sci. Nat. Neuchâtel, t. iv. part 2, pp. 111.

——. Description de trois espèces d'Echinides appartenant à la famille des Cidaridées. Ibid. p. 14.

Ludwig, Rudolf. Geologische Skizze der Umgebung von Syzran an der Volga. [Geological Sketches of the neighbourhood of Syzran on the Volga.] Bull. Soc. Imp. Nat. Moscou, p. 372.

——. Die Steinkohlen von Kolomenskoi an der Moskwa. Ibid. p. 381.

——. Braunkohlen- und Sphärosideritlager in der Nähe von Cholumtzky im Viatkaschen. Ibid. p. 383.

MacPherson, Joseph. Memoria sobre la estructura de la Serrania de Ronda. Cadiz.

Describes the orographical structure and geological formation of that part of the Province of Malaga which lies to the left of the river Guadiaro. Nearly all the series, from the Palæozoic rocks to the Pliocene deposits, occurs in this district. The most important fact brought forward is the existence of an enormous mass of Serpentine, about 42 kilometres long, and about 18 to 20 kilometres in maximum width, lying between the "Meseta de Ronda" and the sea, the upheaval of which appears to have been the main cause in imparting their present relief to those mountains. A geological map and a plate of 7 sections are given. J. M'P.

Maggi, L. Sulla geognosia del Sasso Meraro in Valcuvia. Rend. R. Ist. Lomb. ser. 2, vol. vii. pp. 58–66.

Mallett, E. J. On Middle Park Mineral Coal. Rocky Mountain News, Nov. 19 (noticed in Amer. Journ. ser. 3, vol. ix. p. 146).

Melsens, —. Note sur l'importance du gisement de phosphate de chaux des environs de Ciply (province de Hainaut). [Phosphatic deposit of Ciply, Hainault.] Bull. Ac. Roy. Belg. 2 sér. t. xxxviii. pp. 23–52.

Milne, J. Notes on the Physical Features and Mineralogy of Newfoundland. Quart. Journ. Geol. Soc. vol. xxx. pp. 722–745, sketch map and 4 woodcuts.

Treats of physical features, ice-action, and lakes. Concludes that there has been:—1, a polar ice-flow from the N.E., aided in its action by following the strike of the beds; 2, local glaciation; 3, later denudation, mechanical and chemical, the sea cutting in along the strike of the beds. Notes follow on mineral localities, plumbaginous veins, gypsum, coal, and magnetic iron. The paper ends with a summary, from Mr. A. Murray's Reports, of places not visited by the author. W. T.

Mojsisovics, Dr. E. von. Faunengebiete und Faciesgebilde der Trias-Periode in den Ost-Alpen. [Range of the faunæ and facies of the divisions of the Trias in the Eastern Alps.] Jahrb. k.-k. geol. Reichs. Bd. xxiv. pp. 81–134. Abstract in Verhandl. pp. 90, 91, under a different title.

Divides the beds above the Alpine Muschelkalk into Noric and Carnic groups. The Noric beds of the district east of Berchtesgaden, in which the Zlambach and Lower Hallstadt beds were deposited, do not contain a single species identical with Noric beds in other parts of the Alps, that district having been entirely isolated: the former is distinguished as the "Juvavic province" of the Noric epoch, and the latter as the "Mediterranean province." Many of the divisions which have been made in the Alpine Trias are held to be only local facies; and it is said to be impossible to parallel bed for bed Alpine with extra-Alpine Triassic deposits. The Carnic group includes, immediately below the Rhætic, 1, Hauptdolomit; 2, Raibl or *Cardita*-beds; 3, zone of *Tr. Aonoïdes* (Schlerndolomit, &c.); 4, St. Cassian zone. The Lunzer sandstone, Bleiberg and Reingrabner shales, Arlberg limestone, Gorno shales, &c. are reckoned different facies of the Raibl beds. Classifications of beds in several districts are given in tabular form. E. B. T.

Moore, R. The Coal and Iron Trades of the West of Scotland. Min. Journ. vol. xliv. p. 1141.

History of trade, modes of working, list of Carboniferous ironstones, and trade statistics.

Navia, Severo. Nota sobre la Plata sulfúrea pseudomórfosis de Rosicler oscuro. Naturaleza, t. iii. pp. 154–156.

Olavarria, Manuel. Datos geologico-mineros recojidos en la Provincia de Santander. Bol. Com. map. geol. Españ. vol. i.

Notes on the geology and mineral wealth of the Province of Santander. Mentions the fact of having found an elephant's molar converted into carbonate of zinc. J. M'P.

Pearce, H. In the tracks of Old Welsh Glaciers. Dublin Univ. Mag. August.

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Pettersen, Karl. Geological Investigations in Tromsö Amt iv. Roy. Norwegian Soc. Writings, vol. vii. pp. 260–444.

From a list in Geol. Mag. dec. ii. vol. ii. p. 386. As also is the following.

——. On the Occurrence of Elæolite in West Finmarken. Stockholm Geol. Soc. Discussions, vol. ii. pp. 220–222.

Pierson, W. M. Correspondence relative to the Discovery of a Large Meteorite in Mexico. Ann. Rep. Smithson. Inst. for 1873, pp. 419–422.

A mass of meteoric iron, 2½ feet square, and weighing, it is supposed, over 5000 pounds, was discovered in the ruins of the Casas Grandes, at the foot of the Sierra Madre, State of Chihuahua. R. E., Jun.

Pollacci, E. Intorno all' azione dello zolfo sui carbonati terrosi, e particolarmente su quello neutro di calcio, con cenni risguardanti la geologia e l'agricoltura. Rend. R. Ist. Lomb. ser. 2, vol. vii. pp. 238–248.

Pošepny, Franz. Geologisch-montanische Studie der Erzlagerstätten von Rézbánya. [Mining geology of the ore-deposits of Rezbanya.] Budapest.

The first part is a geological account of the mining district of Rezbanya. The second part is devoted to the mining characteristics of that region. A coloured geological map (scale 1 to 28,800) accompanies the memoir. G. A. L.

——. Der Bergbau-District von Mies. [Mining-district of Mies, Bohemia.] Vienna.

Prestwich, J. Sur la structure des Couches du Crag de Norfolk et de Suffolk avec quelques observations sur leurs restes organiques. Traduit de l'anglais par M. Mourlon.

A translation of the well-known papers on the Crag in Quart. Journ. Geol. Soc.

Raymond, R. W. Statistics of Mines and Mining. 6th Ann. Rep. pp. 585. 8vo. Washington.

Readwin, T. A. The Mineral Wealth of Ireland. Min. Journ. Feb. 7.

Richardson, C. S. Colorado Silver Mines.—The Great Caribou. Min. Journ. April 25.

A description of the lode, with 6 woodcuts.

Rougemont, Ph. de. Sur le Phyllosome fossile de Solenhofen. Bull. Soc. Sci. Nat. Neuchâtel, t. x. cah. i. pp. 3, 4.

Rütimeyer, L. Ueber Thal- und Seebildung. [On the formation of Valleys and Lakes.] Ed. 2. Basle.

Smith, A. K. Notes on the quality of Hartley and Greta Shale for the Manufacture of Gas, together with Description of the new Coal-seam at Greta. Trans. Roy. Soc. Vict. x. pp. 5–11.

Gives a section of the beds in Anvil Creek, at Greta (N. S. Wales), taken from a Report by the late W. Keene.

Spezia, G. Nota sopra un calcifiro della zona delle pietre verdi. At. R. Ac. Sci. Turin, vol. x. pp. 19–29, 1 plate.

Stevenson, J. J. On the Alleged Parallelism of Coal Beds. Proc. Amer. Phil. Soc, vol. xiv. no. 93, pp. 283–295.

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Gives notes of occurrence in the Southern Alleghanies.

Topley, W. The Geology of the Neighbourhood,—in Pelton's Illustrated Guide to Tunbridge Wells, ed. 6. Chap. x. pp. 176–185, reprinted from ed. 5 (1871). 8vo. Tunbridge Wells.

Tournouër, —. Sur les terrains tertiaires supérieurs du bassin de Théziers (Gard), et sur le niveau géologique du *Potamides Basteroti* dans le bassin du Rhône. [U. Tertiaries of the Théziers Basin (Gard), and the geological horizon of *Potamides Basteroti* in the Rhône Basin.] Bull. Soc. Géol. France, 3 sér. t. ii. pp. 287–307, plate ix.

Describes the fluvio-marine series of Théziers, and the marine and fluviatile series of Vaquières. Under the latter he distinguishes:—1, the marine beds of Vaquières and St. Amand; 2, the fluvio-marine beds of Vaquières with *Potamides Basteroti* and with vegetable remains; 3, beds of Montpellier with *Potamides Basteroti*; 4, beds of Visau (Vaucluse) with *Potamides Basteroti*. The last three are referred to the upper part of the L. Pliocene; among the species characteristic of this zone the following are described as new:—*Paludestrina Escoffieræ*, *Melanopsis Neumayri*, *Dreyssensia sub-Basteroti*. G. A. L.

Trautschold, H. Fischreste aus dem Devonischen des Gouvernements Sula. Mem. Soc. Imp. Nat. Moscou, t. xiii. liv. 4, p. 261.

——. Die Kalkbrüche von Mjatschkowa. Eine Monographie des obern Bergkalkes. Mém. Soc. Imp. Nat. Moscou, t. xiii. liv. 4, p. 276.

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Villa, G. B. Gita geologica sugli Appennini centrali della provincia di Pesaro ed Urbino. At. Soc. Ital. Sci. Nat. vol. xvi. p. 81.

Ville, —. Situation de l'industrie minière des départements d'Alger, d'Oran et de Constantine, au commencement de 1874. [State of Mining in the Departments of Algiers, &c.] Paris.

Gives details of the state of explorations and workings in the Algerian territory.

Walker, Prof. F. A. Statistical Atlas of the United States, based on the results of the Ninth Census, 1870. Washington.

Contains two geological maps—one showing the chief formations, the other the Coal Measures only.

Warren, Major G. K. An Essay concerning important Physical Features exhibited in the Valley of the Minnesota River, and upon their signification. Pp. 22, 5 plates (maps, &c.). 8vo. Washington.

Watson, R. A. The Commercial Future of Ireland.—The Iron Mines of Antrim. Min. Journ. Feb. 7.

Extracts from a paper in the Dublin University Magazine for January.

Whitley, N. The Brixham Cavern and its Testimony to the Antiquity of Man;—examined. Journ. Vict. Inst. vol. viii. pp. 211–229, with Discussion; ground-plan (woodcut).

Gives an account of the exploration of the cavern. Considers that the flakes in the cavern have been derived from a "trail of drift gravel" scattered over the table-land above, and were washed in with the loam and gravel in which they are found, and that these flakes are due to natural causes. Concludes that "this Cavern furnishes no satisfactory evidence of the existence of Palæolithic man." W. W.

Winchell, N. H., and S. F. **Peckham**. The Geological and Natural-History Survey of Minnesota. 2nd Annual Report (for 1873). Pp. 75–219. 8vo. St. Paul.

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Winkler, T. C. Le *Pterodactylus Kochi* du Musée Teyler. Arch. Mus. Teyler, vol. iii. fasc. 4, plate.

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Zigno, Baron A. **de**. Annotazioni Paleontologiche. Pesci fossili nuovi del Calcare Eoceno dei Monti Bolca e Postale. [New Fossil Fish, Eocene limestone of Monte Bolca.] Mem. Ist. Ven. vol. xviii. 3 plates.

Datos geológico-mineros de la Provincia de Jaen. By the Commissioners of the geological map of Spain, from data forwarded by Don **Francisco Garcia Araus**. Bol. Com. map. geol. Españ. vol. i.

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The following titles came to hand just as this sheet was going to press:—

Dewalque, G. Sur la Corrélation des Formations Cambriennes de la Belgique et du Pays de Galles. Bull. Ac. Roy. Belg. 2 sér. t. xxxvii. no. 5, pp. 596–598.

Malaise, M. C. Sur l'âge de quelques Couches du Terrain Ardennais des Environs de Spa. Bull. Ac. Roy. Belg. 2 sér. t. xxxvii. no. 6, p. 800.

Paglia, Prof. E. Valli Salse di Sermide nel Mantovano. [Salt Valleys of Sermide, Mantua.] At. Soc. Ital. Sci. Nat. vol. xvii. fasc. ii. pp. 179–208.

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